

# MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society*

Volume 23

OCTOBER, 1940

No. 10

## AN AMERICAN HEALTH PROGRAM\*

NATHAN B. VAN ETEN, M.D.  
New York City

AWAY back in the era of Babylonian culture, practitioners of healing arts were compelled to organize themselves for the protection of the public from the deceptions of charlatans, quacks and fakirs.

Living under various codes, a cohesive idealism carried them through the centuries—until about two thousand years ago medical organizations were crystalized by the followers of Hippocrates, and the altruistic traditions of the Hippocratic Code have been cherished with rare fidelity. The Hippocratic Code has survived the explosions of successive theories of the science of medicine and still lives as the foundation of medical ethics.

Within a few weeks thousands of young graduates from medical schools in America will listen to a reading of this ancient document and will raise their right hands and swear to uphold it. Very few of them will fail to keep this obligation as their consecration to the service of the sick.

However divergent their ideas concerning the manner of this service, all physicians stand firmly upon this ancient rock.

The evolution of organized medicine in America dates from the founding of the first hospital—by Benjamin Franklin in 1752 in Philadelphia. A group of physicians forming themselves into a hospital staff merged their individualities into an organization which promised to deliver medical care to the sick poor. Soon afterwards medical societies and medical colleges were started and American medical education began to replace European medical education.

All of these establishments represented local efforts working independently. Consequently

there were very uneven standards of quality until the organization of the American Medical Association in 1846, when a federation of medical societies was erected and a serious attempt was made to bring the levels of education and of the practice of medicine up to the highest known standards of the time. The American Medical Association has worked at this job steadily through its councils on Medical Education and Hospitals and on Pharmacy and Chemistry.

Its Judicial Council has jealously guarded the ethics of all practitioners and has been a constant stimulant to an unfailing idealism.

The democratic organization of the American Medical Association gives each one of its one hundred and sixteen thousand members a voice in its affairs. Its House of Delegates, representing every state and territory, originates and strengthens its policies, and elects officers who are obligated to obey its mandates.

As a direct result of ninety-four years of hard work, medical education and medical service in America is the best in the world. Health statistics are unsurpassed and constantly improving. In spite of this undisputed record there are political theorists and imitative philosophers who would substitute European systems of health administration for this American evolution which has such rich vitality and promises still greater attainments through devoted services to the American people.

Contrast the American with the European scene. Germany is no longer the mecca for advanced education. The masters have been driven out by the lash of paganism and medical education has lapsed below mediocrity. The medical course was cut to two years in 1939 and quacks

\*Address given before the House of Delegates at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 21, 1940.

and nature healers were legalized. For more than half a century compulsory health insurance has been destroying initiative, and the high quality of German medicine is a matter of history. Mass medicine is poor medicine—red tape makes a poor surgical dressing.

In spite of more than a half century of poorer and poorer medical care which has been endured by the German people, who have been under the heel of one form of autocracy after another, I do not believe that the German scientific spirit can be crushed. Too long Germans have been good students and have given humanity epoch making discoveries of the greatest magnitude. Even now out of this most depressing European mess has come the unfolding of chemotherapy in the instance of sulfanilamide. Germans discovered it, French students developed it, English and Danes and Americans are perfecting it.

Let us hope that honest scientific effort will restore to the German people the right to be considered human beings instead of herded cattle.

Our present American success is the accomplishment of professionals working in a liberal democracy—physicians and other scientists who work at it every day, but who are neither satisfied nor complacent about it. American physicians want to make American medicine so much better that there can be no justice in stories of neglected people anywhere in this country; that there can be no justice to support claims that thousands of people suffer and die from diseases that are curable and preventable; that thousands of young mothers die from lack of medical care; and that thousands of children fail to grow to strong maturity because of failure of medical social technics.

All American physicians know that large numbers of people live miserably because they lack proper food and shelter and are consequently poor health hazards. They know that thousands of city dwellers are so crowded into vile tenements that they are denied healthy decencies.

Are American physicians sufficiently aroused to enter upon active local crusades against local pestilence? The doctor must take more than a superficial interest in local political machinery if he would improve the health and happiness of his community.

Community units are the foundation stones of this democracy. The doctor can be a potent force in making these stones strong enough to carry a

civilized structure. The general practitioner is one of the most valuable citizens of this republic. His potentialities for leadership must be revitalized. He must regain his old place as counselor and confessor and the people must demand his leadership.

By and large the general practitioner is competent and conscientious, and while his continuing education is necessary, our greatest problem in this country is a continuous campaign of public education to make our citizens so health conscious that they will seek early treatment while cure is possible and while catastrophes may be prevented.

Education has consistently lowered the mortality from tuberculosis. Education has salvaged thousands of children from destruction by diphtheria and other communicable diseases.

Public health education must be furthered in personal hygiene; in values of foods; in values of sanitary housing; in social hygiene, in the prevention of destructive disease through venereal infection, in eugenics (in thoughtful human mating); in serious study of social science with the hope of reducing the number of insane who fill more hospital beds than all sufferers from all other diseases; in study of the whole man by all practitioners of healing arts and study of the individual in his home and diagnosis of his illnesses and treatment of them on the spot. Investigative thinking upon all of these problems by all our citizens would undoubtedly yield incalculably large dividends in the health of the American people.

Medical organizations have been working for years to improve the quality of medical service and I believe that they will continue to carry on their concerted efforts to save our people from quacks and incompetents in spite of accusations of criminal violations of business laws. Physicians are learned professionals giving service regardless of fee. They are not merchants of health selling medicines, or formulæ, or instruments, or cures. They are so earnest in the quest for means to relieve human suffering that they give their discoveries freely to all the world. They have no desire to restrain any one in the pursuit of their ideals, providing they are doing it honestly, in conformity with established ethical standards and in the best interest of the sick. They are the privileged servants of the sick and the fee is not their master. They are not in busi-



ness. They are in a large sense educators of the public conscience. They are valuable leaven in the ferment of social progress.

For twenty centuries their adherence to the Hippocratic tradition has led them to survive the crashings of many civilizations. This spirit will carry them to continued distinguished service long after the legal technicians have strutted their brief moments in the limelight and have been forgotten.

Readjustments will be made of professional activities in order to digest unpalatable and reactionary theories of public service.

The profession of medicine, including dentistry, and the professions of law and the ministry of religion will rise above persecutory technicalities and in their honest pursuits will continue to raise the level of general understanding of moral and physical values in the United States.

These professions will continue to try to serve at all social levels to the best of their ability. They will not refuse to work at night or Saturdays or on Sundays or holidays. Their ears will not be deaf to cries for help before nine in the morning or after five in the afternoon. They will continue to need public support, but they will not relax their efforts even if the public fails them. They will exercise a priestly privilege to try to lead American citizens to a high appreciation of their good fortune in living in an advanced democracy—a democracy created by the genius of George Washington, guided by the scientific genius of Benjamin Franklin and the organization genius of Thomas Jefferson, who must have thought of the health of the people when he advocated life, liberty and the pursuit of happiness.

I hope and believe that the professions will keep that popular demand nailed to the masthead and that it will still be flying there when your children's grandchildren come into their inheritance and that it will inspire them to continue the processes of evolution to the realization of physical, mental and moral health for the American people.

American physicians are justified in a pride of conquest over disease, but they must not rest upon their laurels.

While new low percentages are reported for tuberculosis, for diphtheria, for the casualties of maternity and for all diseases of children, the statistics of degenerative diseases, of insanity and of preventable communicable disease cannot be

taken lightly. Too many hearts are breaking under modern strains—too many people between the ages of thirty-five and sixty-five are limping along with incapacities—too many cases of smallpox, nearly fifteen thousand in the United States last year and increasing at an alarming rate because public health authority is not obeyed.

General paresis and other syphilis of the central nervous system accounts for a very large proportion of the tenants of our state institutions, every one of which is crowded from ten to fourteen per cent beyond normal capacity. These and contributing economic conditions are stirring the medical profession to demand new organization of health services for the American people, and are expressed in the new platform of the American Medical Association.

Every word of that platform is objective. The false accusations that the American Medical Association is static and reactionary are sharply denied in its letter and spirit.

Two thoughts are expressed which may seem sharply contradictory—one is *centralization* of all governmental health activities in one new department, and the other is *decentralization* of all other health activities into local units of administration.

Coördination of governmental health activities is simply a practical move to do away with much overlapping expense and reduction of duplicating machinery.

Developing local health units may be a device to find sickness where it is and treat it on the spot, shorten governmental procedures and keep the government out of medical practice.

Wherever local problems can be solved, they lessen the mass of national responsibility. If we settle minor problems we shall have few major problems.

The platform deals in generalities. Specific provisions for detailed development will have to be studied with care by all who are interested, such as the professions of medicine, public health nursing and welfare organizations. A great deal of laboratory work is needed. Suggestions might well be made by legislative bodies such as yours.

The essentials of this new platform are co-ordination of government health functions; governmental provision of funds for disease prevention and relief of uncared for sickness on proof of need; development of local responsibility for local demand, and local control of administra-

tion; and encouragement of the private practice of medicine as far as possible in harmony with maintenance of a good quality of medical care.

In 1875 the American Medical Association asked for a secretary of health in the cabinet of the President and has timidly restated its desires at various sessions of the House of Delegates—after which the delegates went home to practice medicine and forgot about it.

Last year in the first session of the present congress on March 6, 1939, Mr. Pfeifer introduced a bill No. H.R. 4791—"To establish a Department of Health." This bill was referred to the Committee on Expenditures in the Executive Department, where it still reposes. It was, however, a first step in the National House of Representatives toward coordinating the health functions of our National Administration, which are now scattered through many separate bureaus and major departments.

If local health departments have proved their value—if state health departments have become indispensable—why has a national health department been so long postponed?

Coördination of all federal health agencies except those of the Army and Navy seems logical. The health of our people should be the honest concern of the chief executive. And the health authority should be a member of his cabinet.

I would like to see a new national department to be known as the Department of Health headed by a secretary who must have had a medical education and be licensed to practice medicine. I would like this new department to include the following bureaus:

1. Public health
2. Infancy and maternal welfare to be transferred from the Labor Department
3. Rehabilitation of veterans
4. Research
5. Licensure
6. Care of indigents
7. And other divisions to care for all other health responsibilities, fusing all departments into one less expensive to operate and eliminating the confusion of overlapping and duplication.

I believe the President should have the benefit of scientific advice in Health and Hygiene within his official family.

Defense against disease is quite as important

as defense against the ideas and domination of foreign enemies.

It seems to me to be timely to drop complicated and slipshod methods and attack the problem courageously and efficiently.

Infancy and maternal welfare developed in the Department of Labor in response to wide outcry against child labor. Its objective has been largely realized and now requires a wider and more general type of direction.

Rehabilitation of veterans, developed with well known administration scandal, under a stimulated emotional campaign, is now well established. Hospitals are widespread and may well have a broader significance with the passing of time under a department of health.

Appropriations for research are now vested in the bureaus of Public Health and in appointed committees. I believe that the value of such work would be greatly enhanced if these studies were coördinated in a Department of Health, where voluntary agencies, such as medical schools, voluntary hospitals and philanthropic foundations could coöperate in directly helpful service for the information of the government.

The National Board of Medical Examiners might fit into a function of a National Health Department.

Medical care of indigency looms as one of the most important functions of government. A concert between local agencies through some new type of local, state and national machinery could well be headed in a National Health Department.

The migrating indigent is one of those for whom no local agency is willing to assume the responsibility. He is pushed from state to state and travels from one seasonal employment to another.

No health insurance scheme can take care of such people who can make no regular contribution to any compulsory or government financing. Their care must be centralized. Would there be a better place for this work than in a National Health Department?

It would seem to be ideal to choose a career man to head this department; some one who has been developed through the present department of Public Health or through service in some of the state administrations.

Examination of the current personnel in the various states shows a real need for competent health officers.

Service in the various fields of public health should be carried on by career persons who should be developed through a special training beyond the ordinary undergraduate course in medicine.

Although it must always be borne in mind that a period of private practice seems to be necessary for understanding intimate personal medical problems, there is reason to feel that those who are to direct public health administration should be specially trained in the science of administration before entering such a field. Too often the health officer is merely a political appointee because he has influential friends rather than because he knows anything about the duties of the office. He should also be made conscious of the fact that he is only an administrator and not a practitioner of medicine.

The public consequence of private practice may need government umpiring, but government participation in private practice must not be tolerated.

I believe that the secretary of health should be a physician who has had enough experience in the practice of medicine to know the viewpoint of the patient as well as that of the physician. He should not be a political theorist who cannot know medical care of the sick because he has never practiced it.

There is evidence of a concerted drive for a general service to the sick, both preventive and curative, supported by taxation and under government control.

There is frequent reiteration of a desire for free medical care, patterned after free public education: all doctors salaried by the state—a complete system for state medicine. There seems to be no limit to the belief that the public purse will be able to pay for it, even in the presence of evidence that state education is already too costly for the public pocket, regardless of the fact that school budgets are now the subject of acrimonious debate and regardless of the mounting national deficit.

In the state of New York last year state education absorbed 43 per cent of the state budget of \$385,000,000. State education takes care of people from the ages of five to twenty-one only, while state medicine would involve the care of people from before birth to interment.

Prohibitive cost means nothing to some political theorists.

A new program must provide something better and simpler than these excursions into Utopia.

I believe that needs for help should be discovered in the smallest political subdivision such as the school district, then referred to the township, to the county, to the state, to the federal authority in that order and that the federal authority should be called upon as infrequently as possible.

I believe that medical service to the economic indigent is the problem of the taxpayer. The economic indigent may be defined as one who is unable to provide the necessities of life for himself and his family.

I believe that medical service to the medical indigent is the problem of the taxpayer. The medical indigent may be defined as one who cannot pay for medical care without sacrificing the necessities of life for himself and his family.

I believe that medical service to these two classes of people should be administered by the medical profession and that the physicians who do this work should be paid by the taxpayer.

I believe that medical service to other people of low income who are able to pay for ordinary but not for catastrophic illnesses should be *shared* by the medical profession and the taxpayer. The medical profession and the taxpayer should provide such needed medical service in tax supported institutions either free or at minimum rates.

I believe that new mechanisms for caring for the health needs of the people involving all political subdivisions from the locality to the federal government should be developed no faster than administrative personnel can be sufficiently trained to be effective.

I believe that preventive medicine, although largely a public health problem involving the control of communicable disease, should be promoted by all practicing physicians, upon whom should be imposed definite civic responsibility.

I believe that every effort should be made to provide for the average man so that he can prepare for emergencies without throwing himself upon the sources of charity.

I believe that budgeting for sickness through insurance providing cash indemnity should be encouraged—as well as insurance against the cost of hospitalization, but that these two forms of insurance should be separate projects.

Compulsory systems of sickness insurance as now operating do not take care of indigents and

are only interested in workers who pay for insurance of this type through payroll deductions.

I believe that the sentiments of groups of religionists who object to compulsory medical care through insurance or otherwise, should be respected so long as their beliefs do not jeopardize the public health through neglect of ordinary health precautions for themselves or the community.

Neither creed nor race nor color should deprive any American of the benefits of the best of clinical medicine, but the manner of its delivery should evolve from simple formulæ. The formulæ should grow from the needs of the people as recognized by the family physician, the public health nurse and local welfare workers. The formulæ should grow into workable being in an orderly way which will require a period of time for short steps before long strides are taken. Much laboratory work must be done, as recognized by the President in his recent proposal to build small hospitals in regions where they are needed. This proposal is in harmony with the new platform of the American Medical Association. It is a sane alternative to the extravagances of the proposed Wagner Health Act. It is a stimulant to local initiative to operate a facility erected by the government for the benefit of the locality. It is also in harmony with the President's private statement on more than one occasion that he is opposed to any extensions of state medicine that can be avoided. It is an immediate forward step toward correcting faulty distribution of medical facilities and may prove as attractive as are many hospitals to young physicians who may be seeking new locations.

The memory of an internship in a hospital furnishing every convenient facility is often disturbing to a young doctor's response to calls to country practices where he must be self dependent.

It is to be hoped that these new hospitals will be placed in response to well established local needs.

At the invitation of the President, a committee from the American Hospital Association, from the Catholic Hospital Association, from the Protestant Hospital Association and the American Medical Association met the President at the White House on January 10.

The committee reports that the President seems to be opposed to the enactment of the Wagner Bill and apparently intends to propose to Con-

gress that a sum approximating \$10,000,000 be appropriated for the purpose of building small hospitals in places where there appears to be great need of hospital facilities. Under the plan proposed by the President, the federal government will build the hospitals, but the community, with or without state aid, will be required to maintain these institutions. The President stated that such hospitals when built will not be placed in undue competition with other hospitals. There was little discussion of details at the conference, though some felt that there should have been more such discussion since the practicalities of the situation seemed to demand it.

Although the medical profession is favorably impressed there has been some expression of fear that the President's proposition is but a stepping stone to the all-inclusive health measure introduced in the Senate last year by Senator Wagner which is still resting in the Committee on Education, where it is supposed to be undergoing revision and is not likely to appear at this session of Congress. In fact, Senator Wagner stated publicly at a meeting in New York on March 28 that revision of the bill was proceeding to harmonize it with the ideas of the American Medical Association. Exactly what is meant by that statement is not known, but it is certain that S-1620 has been sidetracked to allow precedence of the President's program for small hospitals.

It is interesting to note a growing interest in and support of the new program of the American Medical Association. Senator Taft has expressed the hope that the Medical Association or some of its friends would introduce a bill into Congress embodying these basic principles. Other legislators have joined in the opinion that this is desirable. Senator Burke violently opposed the Wagner Health program. From a powerful force within the administration has come the utterance of the Federal Security Administrator, the Honorable Paul McNutt. Speaking before the National Health Council on February 15, 1940, I quote a few paragraphs from his speech which reflect a new line of thought in Washington:

"No program addressed to a few diseases or a few age groups, or a few economic groups can possibly reach our ultimate objective which must be to attain the highest possible level of health for all of our people.

"One important means of reaching this objective is the unification and coördination of health agencies at



the federal, state and local levels. The American Medical Association and the American Public Health Association have recommended the integration of health services at the federal level under one cabinet officer, preferably a secretary of health. A first step has already been made toward functional coordination by the creation of the Federal Security Agency of which it is my privilege to be administrator.

Functionally, the agency is the beginning of a combined department of health, education, and social welfare. There still remain departments of the federal government, although these same activities in the states are administered by a single agency. Our objective must be to attain such integration of health activities that we shall no longer deal with human beings as cases of infectious disease or cancer or pneumonia, as sick babies or sick youths or sick old people, but as whole individuals living in families that make up the 130 million people of the United States of America.

"There has been general agreement as to the objectives of the National Health Bill (S. 1620), but some question as to the sums of money involved and considerable criticism of its administrative provisions. Frankly, as an administrator, I have been seriously disturbed by the dispersion of federal administration proposed in this bill. As you know, the bill gives responsibility to the Children's Bureau for medical care of children, to the Public Health Service for medical care of certain high cost illnesses, and to the Social Security Board for diseases other than those for which the Public Health Service is given responsibility.

"It is my firm belief that the first objective of the bill should be to coordinate the Federal health services. I fail to see how a national health program can be administered adequately with three federal bureaus making grants for the control of different diseases and different groups of the population. Confusion and duplication of effort is bound to result at federal, state and local levels. Not the least confused will be the ultimate beneficiary, whose health problems are artificially segregated according to his age and the nature of his illness."

General activity to stimulate legislation forming a National Health Department under a secretary of health must proceed if the medical profession really desires it. Local work must proceed in our county medical societies to promote local action.

It would be ideal if all county societies would start a study of local needs for medical service. There must be wide divergence of local conditions such as the character of terrain, hilly country, flat country, good or bad roads, bridges over rivers, and general accessibility of doctors and hospitals. Much might be done if there was enough ambulance service at strategic points. I learned very early in my career, from my father who was a railroad surgeon, that patients who were

very sick could endure a good deal of transportation.

When Herman Biggs was health commissioner of the state of New York, he advocated a system of cottage hospitals and laboratories to take care of the rural problem in the state of New York. At a hearing before Governor Smith everybody seemed to favor the project. When the governor said he would like to hear what some country doctor thought about it, finally a doctor from Malone, a town in the northern part of the Adirondacks, arose and said, "Well, Governor, in the summer time the Adirondack region is full of city people and there are plenty of city doctors to take care of them, but in winter very few people are there and the country doctors and country towns have plenty of facilities, all we ask you to do, Governor, is to keep the roads open."

The cottage hospitals were not built. Good roads in the state of New York have largely eliminated the rural problem—there is now a doctor in New York state within thirty minutes of every citizen.

Every county society should be interested to make these studies sincerely. It is important to know whether the county needs hospitals, ambulances, doctors, nurses or welfare workers—whether it can take care of itself or needs state or national financial help.

I presume that doctors in Minnesota are just as much or as little concerned in general health problems, are just as generous or as selfish as doctors in other parts of our country. I presume that in each of your counties a *few* doctors do all the work of your county societies and the others are perfectly willing to let them do it.

Of course, you gentlemen here today are the workers of the Minnesota State Medical Society. I wonder if you take yourselves seriously enough to carry back to every doctor in your counties the real importance for every one of them of cooperation, if we are to bring American medicine to its rightful place in American life.

Every doctor in Minnesota should be a citizen in every sense that citizenship means or implies.

The general practitioner must be revitalized into active leadership of all local political movements concerned with the moral, mental and physical welfare of every citizen of this important state.

We must not take negative positions at a time like this when all sorts of wild theorists are



shouting into the public ear. The public seem to be eager for health education and we must give it to them honestly and freely if we really want America to be a better and happier place in which to live.

The American Health Program has been writing itself for one hundred and eighty-eight years.

The American Medical Association has been

motorizing this program for the last ninety-four years cherishing an ambition not only to conserve all of the verities and values of this medical service evolution, but the projection of them into new objectives for the delivery of better and better medical services to the American people.

If American physicians must have an objective slogan, let it be "Better Medical Care for Every American Citizen."

### THE ROENTGENOLOGIC DIAGNOSIS OF INTRASPINAL PROTRUSION OF INTERVERTEBRAL DISKS\*

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Rochester, Minnesota

WITHIN the past few years considerable literature concerning intraspinal protrusion of the intervertebral disks has appeared and the condition has been firmly established as a definite clinical and pathologic entity. Studies by Deucher and Love indicate that the protruded fragments are composed of fibrocartilage, portions of the nucleus pulposus and occasionally remnants of the notochord. These structures are not ordinarily opaque to roentgen rays and cannot be demonstrated per se in plain roentgenograms. Bone or calcium in quantities gross enough to be revealed roentgenographically is so rare in these protrusions that it is of little practical diagnostic importance.

It would seem that in any condition such as this, in which trauma is such a common etiologic factor, there should be visible in plain roentgenograms some alteration in the structure of the bone or joint that would denote the site of the lesion. Experience with a large number of cases, however, does not bear out this supposition. Narrowing of the intervertebral space at the site of a protruded disk was present in only 31.9 per cent of a recent series of cases. Since similar narrowing may also result from degeneration and fibrosis of an intervertebral disk without protrusion, this change alone without other evidence is only of suggestive value.

Hypertrophic changes localized about the margins of an intervertebral space at the site of a protruded disk occur in such a small percentage of

cases (10 per cent) that they are of little help in the direct localization of a protruded intervertebral disk. Compression fractures of a vertebral body contiguous to the site of a protruded intervertebral disk are not common.

Since plain roentgenograms offer little aid in the recognition of a protruded intervertebral disk, the roentgenologist is dependent on the use of some contrast agent for the indirect visualization of the protrusion. Several such agents, namely, iodized oil, air, oxygen, skiodan and colloidal thorium dioxide have been employed for visualization of the spinal subarachnoid space. Each of these substances has certain advantages and disadvantages; none of them so far has proved ideal. Increasing familiarity with the history and neurologic examination in cases of protruded intervertebral disks indicates that in a fair proportion of cases the diagnosis and localization of the protrusion can be made clinically without resorting to any contrast agent. With this improvement in clinical diagnostic acumen the necessity for the use of a contrast agent will probably diminish and be reserved for those cases in which the diagnosis is in doubt and those in which it is desirable to know precisely the anatomic level of the lesion for the guidance of the neurosurgeon.

#### Iodized Oil Myelography

To date, iodized oil has been used more than any other opaque contrast agent for the roentgenologic visualization of the spinal subarachnoid space. When employed under proper circumstances it has resulted in an accuracy of di-

\*From the Section on Roentgenology, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 22 to 24, 1940.

agnosis that is shared by few other roentgenologic procedures. The chief objections to the use of iodized oil are that it is more or less an irritant to the meninges and is contraindicated in the presence of inflammatory disease. The significance of the irritative action, and the effect of its presence within the subarachnoid space have been discussed pro and con in the literature for some years. Nevertheless, it is the consensus of observers who have used it in a large number of cases, that in properly selected cases the advantages of its use far outweigh any disadvantages that are known. The indiscriminate use of iodized oil in cases of low back pain or sciatic pain is not recommended. No contrast agent should be used unless the clinical and neurologic examination indicates the possible presence of an intraspinal lesion that cannot be localized by ordinary clinical procedures.

The lumbar injection of iodized oil is preferred because it is easier and safer to carry out than cisternal puncture. It is important that the iodized oil be clear, transparent and only faintly yellow before use. Small amounts of iodized oil (0.2 to 2 c.c.) may suffice for the localization of lesions that completely obstruct the canal, but in the interest of early diagnosis and for the localization of lesions before obstruction has occurred, it is necessary to use a quantity of iodized oil sufficient to fill the subarachnoid space at any desired level. In my experience 5 c.c. is the optimal amount for this purpose. Some lesions can be shown with smaller quantities, but on the other hand, a number of surprisingly large lesions, and, in particular, multiple lesions, are easily overlooked if amounts less than 5 c.c. are used.

It is desirable that the roentgenologic study be carried out as soon after the injection as possible, as delayed examination and movements of the patient may lead to separation of the mass and droplet formation. A tilting fluoroscopic table with appropriate foot and shoulder rests is necessary. If the result of the examination of the lumbar spinal subarachnoid space is negative, it is important to examine the subarachnoid space higher up as recent observations have revealed that 50 per cent of patients with tumors of the spinal cord situated in the thoracic region and 30 per cent of patients with such tumors situated in the cervical region have low back pain, or sciatic pain or both as associated or coincidental symptoms. Quantities of iodized oil less than 5 c.c. are

not practical for this phase of the examination.

The deformity of the iodized oil shadow resulting from a protruded intervertebral disk is influenced by the following factors: (1) the posi-

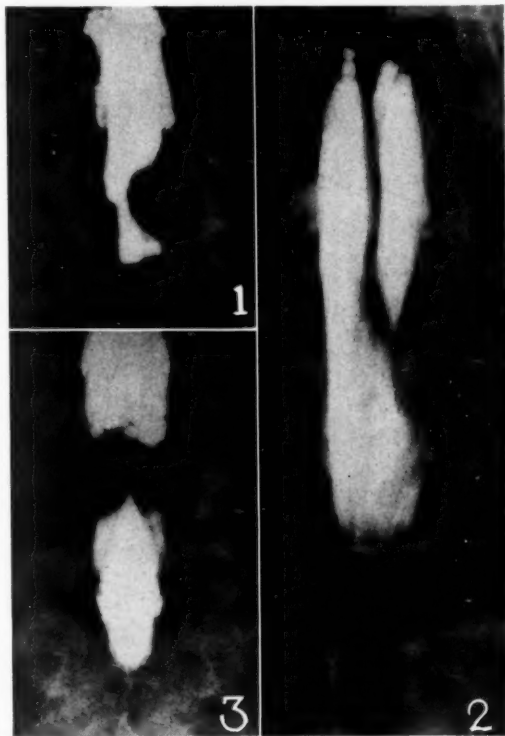


Fig. 1. Intraspinal protrusion of the lumbosacral intervertebral disk. Characteristic unilateral deformity of iodized oil shadow.

Fig. 2. Intraspinal protrusion of the intervertebral disk between the second and third lumbar vertebrae. At the point of obstruction, the shadows of the nerve roots are displaced and compressed by the protrusion. The vertical elongated shadow of diminished density indicates an edematous nerve root, in this case the left second lumbar root.

Fig. 3. Intraspinal protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae. Bilateral deformity of the iodized oil shadow.

tion of the protrusion, (2) size of the protrusion, (3) associated hypertrophy of the ligamentum flavum, (4) changes in the nerve roots (displacement, edema, nonfilling of affected nerve root sleeve) and (5) anatomic variations of the cul-de-sac.

*Position of the Protrusion.*—Except in unusual cases the protruded fragment is situated in the anterior portion of the spinal canal and will produce its greatest effect on the column of iodized oil when the patient is lying in a prone or prone-oblique position. The classic defect is a

sharply defined unilateral rounded indentation of the iodized oil shadow opposite an intervertebral disk (Fig. 1). It occurs in about 65 per cent of cases. Midline protrusions when of moderate size may produce only a central defect.

iodized oil posteriorly and laterally. In the lateral view, its presence is characterized by a broad or rounded indentation on the posterior aspect of the shadow of the iodized oil between contiguous laminae. In the prone or supine positions the hy-

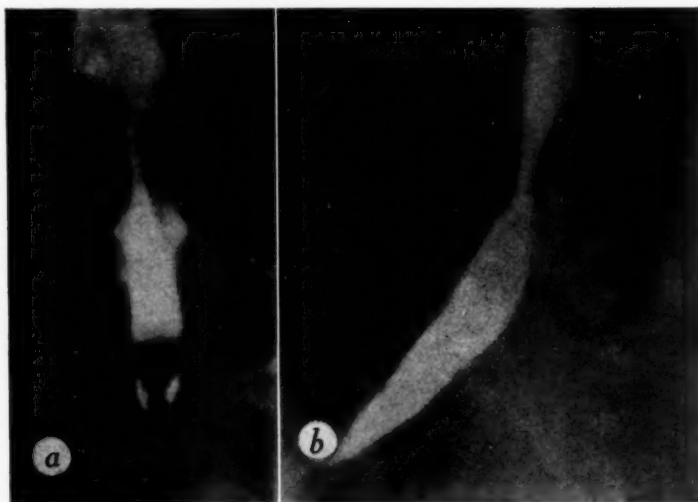


Fig. 4. Intraspinal protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae and associated hypertrophy of the ligamentum flavum; *a*, anteroposterior view revealing broad bilateral deformity of iodized oil shadow; *b*, lateral view revealing anterior indentation of the shadow due to the protruded disk. The broad indentation on the posterior aspect of the shadow at the same level is due to hypertrophy of the ligamentum flavum.

*Size of the Protrusion.*—Except as the iodized oil deformity may be influenced by the presence of hypertrophy of the ligamentum flavum, the larger the protrusion the greater the obstruction of the subarachnoid space will be. Partial obstruction occurs in about 11 per cent of cases and complete obstruction in only about 2.5 per cent of cases (Fig. 2). The larger the protrusion the greater the tendency to produce a bilateral deformity, which occurs in about 35 per cent of cases (Fig. 3).

*Hypertrophy of the Ligamentum Flavum.*—This condition is found frequently in association with a protruded intervertebral disk. It usually occurs at the same level as the protrusion but may occasionally be found at other interspaces. Localized hypertrophy of the ligamentum flavum without coincidental protrusion of a disk is not common. When it does occur it may imitate all the clinical phenomena of a protruded intervertebral disk. Because of the anatomic location of the ligamentum flavum, this structure when it is hypertrophied will compress the column of

pertrophy is portrayed by a broad indentation of the column of iodized oil, generally bilaterally but occasionally unilaterally. When considerable hypertrophy of the ligamentum flavum accompanies a large protruded disk, the mass of iodized oil is compressed between the protruded disk anteriorly and the hypertrophied ligamentum flavum posteriorly and laterally. The resultant deformity is characteristic (Fig. 4*a* and *b*).

*Changes in the Shadow of Nerve Roots.*—In about a third of the cases of protruded intervertebral disk, displacement of shadows of nerve roots will be visible at the site of the protrusion. Abnormal enlargement of a nerve root shadow indicating edema is frequently observed in roentgenograms at or just above the site of a protruded disk (Fig. 2). An early change that results from edema of a nerve root is obliteration of the usual shadow of the nerve sleeve where the root passes through the dura.

*Anatomic Variations of the Cul-de-sac.*—Two anomalies of the terminal portion of the cul-de-

sac which occur in about 5 per cent of cases may complicate the roentgenologic diagnosis of a protruded lumbosacral intervertebral disk. The first is an anomaly in which the terminal portion of the cul-de-sac is narrower than usual below the level of the fourth lumbar intervertebral space. In such a case a moderate protrusion of the lumbosacral disk may not deform the narrow subarachnoid space and a large protrusion may produce only a minimal defect. The second anomaly is one in which the cul-de-sac terminates one or two segments more cephalad than usual with or without a variation in its diameter. In a few instances, the cul-de-sac will terminate above the level of the lumbosacral interspace. When either condition is present, especially the latter, it is obvious that a lumbosacral protrusion may not be disclosed by means of iodized oil or any other contrast agent.

### Air Myelography

The use of air or oxygen for the study of the spinal subarachnoid space has been revived in recent years and this procedure has certain advantages: (1) there are no contraindications, (2) the air is resorbed following examination, (3) there is no irritating effect other than that which temporarily results from the injection and (4) roentgenoscopy is not necessary.

On the other hand, there are certain definite disadvantages: (1) the procedure is unsatisfactory for nonobstructing lesions above the conus, (2) the shadows and defects are less distinct than those caused by iodized oil, their interpretation is more difficult and the likelihood of error is increased, (3) roentgenoscopic verification of the defect is not possible, (4) inconclusive examinations are much more frequent than with iodized oil and (5) experience has shown that the results of air studies, especially when negative, are less accurate than the results obtained with iodized oil.

Experience indicates that if the suspected level of a lesion is at or above the conus, the use of air or oxygen will not help in diagnosis unless obstruction of the subarachnoid space has occurred. This results from the fact that air or oxygen is very difficult to hold in a desired position in the thoracic or cervical portion of the spinal canal and its use in these regions is further complicated by the superimposition of the shadow of air in the trachea, larynx and pharynx which

renders the interpretation of resulting shadows difficult or impossible. Iodized oil therefore is the medium of choice for the demonstration of lesions at or above the conus.

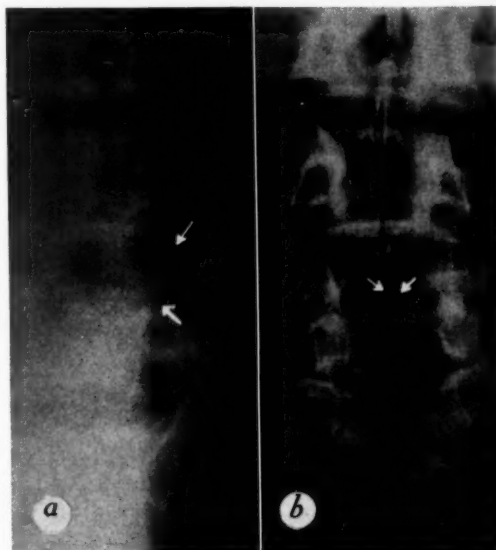


Fig. 5. Intraspinal protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae. Spinogram (air study): *a*, lateral view showing indentation of anterior aspect of the air shadow by the protruded disk at the site of protrusion; *b*, bilateral narrowing of the air shadow opposite intervertebral space between the fourth and fifth lumbar vertebrae.

Statistics<sup>3</sup> indicate that the great majority of protruded intervertebral disks occur in the lumbar and lumbosacral regions where they are accessible to examination by means of either air or iodized oil. Since there is a reasonable chance that the protrusions may be disclosed by means of air or oxygen, it is probably good judgment to attempt their localization by this method before iodized oil is resorted to (Fig. 5). If the results of air studies are positive much has been gained because in 83 per cent of such cases a pathologic lesion has been found by the surgeon at the site of the deformity. If the results of air studies are inconclusive or unsatisfactory, then iodized oil may be used. If the air studies result in negative findings and the history and neurologic examination indicate the probable presence of a protruded disk, the surgeon must then decide whether to check the findings in the spinogram by means of iodized oil or whether to advise laminectomy on the basis of the history and neurologic findings. In my experience, a negative spinogram (air study) has proved com-



paratively unreliable because in a high percentage (77 per cent) of such cases a pathologic lesion has been found at operation. This fact should not be lost sight of by the clinician in appraising the results of such studies with air. When the use of air reveals either a deformity that will not account for the patient's symptoms or a lesion, the level of which is not compatible with the symptoms, the results should be confirmed with iodized oil before laminectomy is advised. Further experience in the interpretation of spinograms (air studies) will undoubtedly re-

sult in improvement of the diagnostic accuracy of the procedure. However, because of certain basic limitations of the method it is not likely that its efficiency will ever equal that attained by iodized oil myelography.

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## TREATMENT OF PROTRUDED INTERVERTEBRAL DISKS\*

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IT is a distinct pleasure for me to have the privilege of reporting to our State Society again within two years on a subject which has not decreased but has tremendously increased in interest not only in this state but throughout the United States and in many foreign lands.

When I spoke, in Duluth, at the State Meeting two years ago I made the following statement<sup>1</sup>: "There is only one treatment for protrusion of an intervertebral disk that is producing compression of the spinal cord or of a nerve root. When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, laminectomy for the express purpose of removing the protruded portion of the disk should be performed."<sup>2</sup> Today that statement is just as true as it was then and it needs only to be emphasized. The second sentence, which reads as follows, "When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, laminectomy for the express purpose of removing the protruded portion of the disk should be performed," should, in the light of our increased knowledge of the lesion and our increased technical ability, be changed to, "When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, it

should be removed." This change is necessitated by the fact that since December, 1938, it has been possible in a large percentage of cases to remove protruded intervertebral disks without removing any bone from the spinal column.

In order to perform such operations it is essential that the operator know which disk is protruded, have special instruments and a large experience dealing with small intraspinal lesions. It is therefore essential in the great majority of cases to have the lesion visualized by a contrast medium. The use of a contrast medium serves not only to demonstrate the protrusion but also to exclude or demonstrate other lesions. Since not infrequently protrusions are multiple it is necessary to know the condition of the other disks. At times also the history and findings on examination seem to indicate definitely that the difficulty experienced by the patient is the result of a disk protrusion, whereas in reality the true pathology is an intraspinal neoplasm. This may be recognized at the time of diagnostic lumbar puncture, at the time of visualization of the spinal canal or only when the lesion is uncovered at operation. When operating, therefore, for a protruded intervertebral disk, the surgeon should be prepared to handle any intraspinal lesion that might be encountered. The electrosurgical unit, suction apparatus and other special apparatus that is standard equipment in a modern neurosurgical amphitheater should be at hand and

\*From the Section on Neurosurgery, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 22, 1940.



ready for use. Well-trained assistants and surgical nursing staff are essential.

All patients who come to The Mayo Clinic complaining of pain low in the back or sciatic pain or both are not operated on for protruded intervertebral disk. In fact, all patients with such a complaint are not fully investigated for such a lesion. Only those patients who have definite evidence of pressure on the spinal cord or on a nerve root and those who are unable to carry on their normal activities are thoroughly investigated (that is, by studies of the spinal fluid with or without visualization of the spinal subarachnoid space). These patients who have had distress for a short time and who show no impairment of nerve function and those who are able to keep up with their usual work with the aid of some physical therapy plus the wearing of a support are not urged to undergo extensive investigation with the idea of undergoing operation. We see many patients whose history and physical examination suggest the probability of protrusion of a disk and we advise conservative therapy for them. They are told what we suspect as the underlying pathologic lesion and are told that if the symptoms increase in severity or become incapacitating, then they should submit to a thorough investigation and possibly to operation.

In order to accomplish most for the large group of patients who have backache and sciatic pain, team work and coöperation on the part of the patient, the family physician and those in special fields is essential. The general condition of the patient must be evaluated not alone from the standpoint of physical health but also from the economic point of view. His home life should be considered, the type of work to which he is accustomed and whether or not there is an insurance or compensation angle.

When it is agreed that the patient is incapacitated as far as his usual activities are concerned and that relief must be offered, the close coöperation of the clinician, orthopedist, neurologist, roentgenologist and neurosurgeon will result in the best possible care. Today it is impossible for any one doctor to know all branches of medicine well and only through close coöperation can we expect to obtain the best results from our therapeutic endeavors.

When an operation for protruded intervertebral disk is to be undertaken, all pertinent factors relative to the diagnosis, the patient's general

physical condition, the presence of complications, orthopedic or otherwise and the surgeon's experience plus the question of insurance or compensation liability should be thoroughly considered. There are many things other than the presence of a protruded portion of fibrocartilage within the spinal canal which influence the result of therapy.

The mere presence of a history of backache and sciatic pain or of both, even with positive roentgenologic evidence, is not sufficient indication for a surgical attack on the lesion if these are any other factors of greater weight which contraindicate a major surgical procedure. The operative removal of a protruded disk is a major surgical procedure and it should not be attempted by anyone not familiar with intraspinal surgery. Although the history, findings and roentgenograms may indicate the protrusion of a disk, at operation a primary tumor of the spinal cord or of the nerve roots may be encountered. This is true even in spite of the onset of symptoms after a specific injury. I recall a young girl who related what we could call a typical history of protrusion of a lumbar disk and the findings on physical examination likewise were typical. At operation, however, she was found to have an ependymoma of the filum terminale. An extensive intradural operation that required the use of the electrosurgical unit and all of the special neurosurgical equipment had to be performed. Before undertaking an operation for a protruded disk, it is extremely important to know whether or not there is an insurance or compensation angle. This is important not alone for studies of final results but also for carrying out the pre-operative examinations, evaluating symptoms and following the patient's postoperative period of hospital convalescence. Patients who think that compensation may be had for the most part make poor witnesses for themselves in the examining room. Their symptoms are likely to be bizarre, more numerous and much more marked than those of an individual who is interested only in getting relief from his distress. Patients who have compensation in view seem to feel that they must impress the examiner with their terrific plight. One must be very careful in examining such patients lest he be misled into placing too much emphasis on inconsequential symptoms and signs, or lest he overlook pathognomonic signs hidden by functional states.

In order to check up on our diagnostic ability and to evaluate the progress of the neurosurgical attack on intractable backache and sciatica, I asked Dr. Patton, neurosurgical first assistant, The Mayo Foundation, to analyze the last 100 records of cases previous to January 1, 1940, in which operation was performed because of a diagnosis of protruded intervertebral disk. Out of this study came some very interesting facts. These cases represent 100 consecutive spinal operations performed by Adson, Craig, Baker and me. Of the 100 patients, ninety-one were found to have a protrusion of a single disk, whereas each of three patients had two protruded disks. The remaining six patients were found to have thickening and fibrosis<sup>2</sup> (so-called hypertrophy) of one or more ligamenta flava without protrusion of a disk. Four of these six cases had two abnormal ligamenta flava whereas the other two had only one thickened ligament.

In the period covered by these 100 cases, radiopaque oil\* was injected in eight cases to confirm our clinical diagnosis and to locate more accurately the level of the lesion. In seven of the eight cases, the roentgenologic findings were positive for protruded disk; in the eighth case the findings were reported by the roentgenologist as negative. In view of this patient's history and clinical findings, the neurologist, neurosurgeon, and orthopedist all felt that radical treatment was indicated. He had had all the conservative measures without relief. His story was suggestive of a protruded disk. The patient's fourth and fifth lumbar disks were explored by the neurosurgeon without detecting any abnormality. There was definite thickening and fibrosis of the ligamentum flavum which was resected. The orthopedist who was present transplanted a graft from the flat internal surface of the patient's tibia to the lumbosacral region for the purpose of fusing the last two lumbar vertebrae and the first two sacral vertebrae. This procedure had been explained to the patient prior to his decision to have an operation.

At times, because of the coexistence of an orthopedic condition, a bone graft is applied by the orthopedic surgeon after the neurosurgeon has removed a typical protruded disk.

\*Although radiopaque oil is by far the best contrast medium for the visualization of the spinal canal we have tried to avoid its use whenever possible because of its slow absorptibility. This is particularly true in the handling of medico-legal cases. It is so easy for the patient who has an opaque substance in the spinal canal to try to capitalize on its presence. We are now using air almost entirely for visualization of the lumbar region of the spinal canal.<sup>1</sup>

It is the opinion of orthopedists and neurosurgeons at the clinic that bone grafting or fusion is necessary in only a small percentage of cases in which a protruded disk is found and is removed.

### Results of Operative Treatment of Protruded Intervertebral Disks

When a patient is operated on and a classical protrusion of a lumbar disk is removed because of its production of pain low in the back or sciatic pain or both, that patient should obtain immediate relief of his symptoms. In a small percentage of such cases, several days will elapse before complete relief ensues. In a very small percentage of cases the patient will experience immediate relief but will have some distress when up and around for as long as two or three months after operation. The patient whose convalescence is not complicated by other organic lesions or medico-legal problems is usually back at his occupation three months after dismissal. In any compensation case or insurance case, at least twice as long a period of convalescence is likely to be required. Such individuals must be convinced that they are relieved and are able to carry on normally. If compensation is pending and there is a dispute regarding liability, and particularly if there is going to be a trial in open court, the patient is prone to have a neurosis develop and to present many symptoms which cannot be explained on an organic basis. The most careful examination may fail to reveal any signs indicative of organic disease and those signs which were present prior to operation may be gone but the patient will insist that he is incapacitated and unable to do any work. If the question of insurance and compensation could be settled prior to operation, I feel sure this group of patients would obtain a much more satisfactory final result.

That the surgical removal of protruded intervertebral disks is based on sound anatomic, pathologic and surgical grounds is clear to all who have had much experience with the lesion. That all patients are not relieved of their complaints following operation likewise is apparent and is again admitted.

When we stop to consider, however, that this group of patients is suffering from intractable pain which has been present on the average for several years and which has not responded to any type of conservative treatment or to many

types of radical operations, such as manipulation under anesthesia, open operation and stretching of the sciatic nerve, fasciotomy and bone grafting, we can still speak optimistically about the results of surgical removal of the protruded portion of intervertebral disks even though this operation does not relieve all patients.

At the present time we are undertaking a follow-up study of all patients operated on at The Mayo Clinic for protruded intervertebral disk. This study will require a great deal of time and effort and when it is completed the results will be published. At present, although we cannot yet give accurate statistics on our cases, there are certain observations which have been made which seem worthy of record.

The mortality rate associated with operations for protruded intervertebral disks in our hands has been about 0.5 per cent. About 3 to 5 per cent of the patients who come to operation for a protruded disk require bone grafting or fusion because of a coexisting orthopedic condition. The fusions are performed at the time of the intraspinal operation by one of our orthopedic colleagues who, of course, has seen and examined the patient prior to operation. About 1 per cent of the patients will return, usually after unusual stress or strain to the back, for the removal of another protruded disk. About 1 or 2 per cent of the patients who have been operated on for a protruded disk will require fusion subsequently because of a static type of backache or because of failure to obtain complete relief following the removal of the protruded disk.

In spite of the most careful selection of patients for operation and the most painstaking care in the performance of these operations, there will be a group of patients who are not completely relieved. Some of these will fail to obtain relief because of the coexistence of other diseases which may produce or contribute to the production of the same symptoms, such as spondylitis, endarteritis obliterans, diabetes and old vertebral fractures (rare with protruded disks). Patients with a low threshold to pain may continue to complain of distress in the back and may focus their minds on the site of operation. There are others, who, often for reasons best known to themselves and at times when discovered by the physician adequate enough, have an overpowering desire for sympathy and continue to enjoy "poor" health. In some cases, it is obvious

at the time of operation that the compressed cord or nerve root has sustained irreparable damage and even though the pressure is removed the patient is likely to have residual symptoms or signs. In other cases, the nature of the lesion must be that of an interstitial neuritis (from pressure) with marked fibrosis. At times it can be seen that some of the fibers of the compressed nerve root have been interrupted by the protruded disk.

By far the most troublesome group and the hardest to appraise satisfactorily consists of those cases in which there is litigation pending. This group demands the utmost consideration not alone because of the difficulties involved but also because of the great tendency for people to sue one another and particularly to sue corporations in an attempt to obtain compensation for their misfortunes regardless of whether or not the suit is justified. In this connection careful attention should be paid to the taking of the history in these cases and dates of alleged injuries should be recorded. The question of compensation and insurance problems should be noted, if it is possible to get the information, while the history is recorded. Any physician who has seen many industrial, automobile or railroad accident cases knows how difficult it is to obtain an excellent result in such cases. Likewise, if a patient is carrying disability insurance that will pay him more than his declining income, it is easy to see that it might be difficult to cure him by means of any type of therapy. The insurance companies, of course, realize this, and the larger companies are very careful about writing policies with clauses which would entitle the insured to collect as much as or more than his income in case of disability.

We, as physicians, must continue, of course, to do everything that we can to alleviate suffering and we must strive to restore all injured persons to their former activities, but at times there are factors over which we have little or no control and these factors militate against the success we so sincerely desire from our therapeutic efforts.

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## INTRACRANIAL TUMORS\*

### A Study of 467 Histologically Verified Cases

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SINCE the appearance of the various studies on the classification of the glioma group of brain tumors (Roussy, L hermitte and Cornil,<sup>28</sup> Roussy and Oberling,<sup>29</sup> Bailey and Cushing,<sup>9</sup> and Bailey<sup>4,5</sup>) a great impetus has been provided for the investigation of all intracranial tumors. Many investigators have reviewed those brain tumors that have been available in their laboratories, in an attempt to reclassify these neoplasms in the light of these more recent advances. An attempt has also been made by some to correlate the various individual histological types with the age of the patient, the location within the brain or intracranial cavity, the rapidity of growth and finally the amenability to surgery or the response of the tumor to deep x-ray therapy. Such reports have been published by Davidoff and Ferraro,<sup>16</sup> Cushing,<sup>14</sup> Bailey,<sup>4</sup> and Gogel.<sup>20</sup>

In keeping with these advances in our knowledge regarding the intracranial neoplasms, an attempt was made to collect, study and reclassify all such tumors that were available from the Department of Pathology and the Division of Nervous and Mental Diseases of the University of Minnesota. Only those cases were selected in which sufficient material or sections were available to allow for a careful histological study. Much of the older material was unsatisfactory while in many cases no material had been preserved. After due selection there remained a total of 467 tumors that were used in the present investigation. For our statistical studies we also included twelve pituitary adenomas which had been unmistakably diagnosed by x-ray, thus bringing the total tumors to 479. Because of the infrequency of operation upon pituitary adenomas and also because of their prolonged course, they are infrequently obtained for histological study. It is for this reason that these 12 clinically diagnosed cases were included, in order to make this present series as representative as possible. In all cases fairly complete records were available. This material appeared to us to offer a fairly accurate picture of the frequency of the

various types of tumors, inasmuch as the cases were obtained without selection throughout the state. Since the greatest portion of the material was obtained at autopsy, (406 out of 479 cases or 85 per cent), a study of the whole tumor was usually possible as well as a careful investigation of the varying histology in different portions of the tumor.

The intracranial tumors in this study were divided into the following nine groups described and used by Bailey: tumors of the nerves, tumors of the meninges, gliomas, vascular tumors, tumors of mixed tissue, hypophyseal tumors, granulomas, miscellaneous group, and metastatic tumors. The relative frequency of each is listed in Table I.

A comparison of our figures with those of other investigators is shown in Table II. All figures have been corrected to coincide with the classification presented in this study.

A brief statement concerning our experience with these groups of intracranial tumors can now appropriately be undertaken.

#### Tumors of Nerves

This group of intracranial neoplasms includes the acoustic neuromas, the optic nerve gliomas, and the cerebral type of neurofibromatosis. It comprised but 1.5 per cent of our cases. This is in direct contrast to the series of Bailey<sup>4</sup> and Cushing,<sup>14</sup> where 176, or 9.1 per cent, of their tumors were acoustic neuromas alone. The latter tumor, which was by far the most common one in this group, arises from the nerve sheath, although there is still some question as to whether they are Schwannian or connective tissue in origin. Most investigators feel that they probably arise from the endo-perineurium and are collagenous in origin. The nerve fibers usually passed around this tumor and were never found within it.

A von Recklinghausen's disease in which the predominant involvement is intracranial is of rather unusual occurrence; only one such case appeared in the present series.

Optic nerve gliomas are also extremely uncommon. Verhoeff,<sup>30</sup> at the Massachusetts Eye and

\*From Division of Nervous and Mental Diseases, University of Minnesota. Assistance in the accumulation of these data was furnished by the personnel of Work Projects Administration. Official number 665-71-3-69.



## INTRACRANIAL TUMORS—BAKER

TABLE I. FREQUENCY OF DIFFERENT GROUPS OF INTRACRANIAL TUMORS

Type	Operation	Autopsy	Total	Per Cent
I. Tumor of Nerves	2	5	7	1.5%
II. Tumors of Meninges	12	76	88	18.4%
III. Gliomas	38	242	280	58.5%
IV. Vascular Tumors	4	21	25	5.2%
V. Tumors of Mixed Tissue	2	2	4	0.8%
VI. Hypophyseal Tumors	14*	20	34	7.1%
VII. Granuloma	0	30	30	6.3%
VIII. Miscellaneous	1	10	11	2.3%

\*Twelve of these were diagnosed by x-ray and not studied histologically.

TABLE II. COMPARATIVE FREQUENCY OF TUMOR GROUPS

	Bailey & Cushing	Davidoff & Ferraro	Gogel	U. of Minn. Series
I. Tumor of Nerves	176—9.1%	2—2.7%	7—1.6%	7—1.5%
II. Tumors of Meninges	271—14.0%	23—31.5%	83—18.7%	88—18.4%
III. Gliomas	874—45.1%	36—49.3%	239—54.0%	280—58.5%
IV. Vascular Tumors	41—2.1%	0	17—3.8%	25—5.2%
V. Tumor of Mixed Tissue	21—1.1%	3—4.1%	10—2.3%	4—0.8%
VI. Hypophyseal Tumors	452—23.3%	7—9.6%	39—8.8%	34—7.1%
VII. Granuloma	45—2.3%	2—2.7%	6—1.4%	30—6.3%
VIII. Miscellaneous	58—3.0%	0	42—9.5%	11—2.3%
Total	1938	73	443	479

Ear Infirmary, encountered four out of a total 669,857 patients, while Martin and Cushing<sup>25</sup> recorded seven chiasmal tumors out of a total 826 intracranial neoplasms. These tumors are usually gliomas, our case being a fairly typical slow growing astrocytoma. The patient, five years after a partial removal, is still living and well. It appears that these new growths either take origin and remain confined to the intraorbital portion of the nerve or that their growth is slow enough to allow for a long span of life in spite of non-complete removal.

#### Tumors of Meninges—Meningiomas

These are, as a rule, benign encapsulated masses that rarely invade the brain but compress it and may, because of their slow growth, reach huge dimensions. As is well known they frequently invade the skull, producing increased vascularization, hyperostosis or even direct erosion. The current name for these tumors has been adopted as meningiomas, although Mallory<sup>24</sup> and Penfield<sup>27</sup> have felt that on histological grounds the cells of the leptomeninges belong to the fibroblastic series and that these neoplasms should be called arachnoidal fibroblastomas. It is recognized today that they are derived from some embryonal rests in the meninges, but beyond this there is little agreement. Since the probable origin of these tumors is still a moot question, it

seems best to adopt the non-committal term of meningioma until further information is acquired concerning their origin.

In the present study there was a total of eighty-eight meningiomas, which comprised 18.4 per cent of all intracranial tumors. This compares fairly closely to most other series (Bailey and Cushing, 14 per cent; Gogel, 18.7 per cent). Sixty-five per cent of these tumors occurred between the fifth to the seventh decade, while 6 per cent occurred within the first decade. As could be expected from such a slow growing tumor, over one-third of the cases gave histories dating back over a period of at least three years.

The location of the meningiomas was of great interest. The greatest number arose from the region of the sagittal sinus, fourteen being situated anteriorly and four posteriorly. The next most common location was the sphenoid ridge, where ten of the tumors were situated. Next, in order of frequency, these tumors occurred in the cerebellopontine angle, eight; tuberculum sellae, 7; cribriform plate, seven; dura over temporo-parietal region, six; foramen magnum, five; clivus, three; torcula, three; dura over temporal region, two; corpus callosum, pineal and dura over the parietal and occipital regions, one each.

Histologically they presented a great variability in tissue structure. For this reason they were reclassified according to the most prominent



type of tissue present (Table III). This type of classification was used by Bailey and Bucy<sup>8</sup> in their publication on meningiomas.

TABLE III. HISTOLOGIC TYPES OF MENINGIOMAS  
(18.5 per cent of all intracranial tumors)

Tumors of Meninges	Number	Per Cent
1. Fibroblastic	36	40.9
2. Psammomatous	19	21.6
3. Meningotheliomatous	12	13.6
4. Mesenchymal	3	3.4
5. Angioblastic	3	3.4
6. Melanoblastic	3	3.4
7. Lipomatous	3	3.4
8. Osteoblastic	2	2.3
9. Sarcomatous	1	1.1
10. Undetermined	6	6.8
Total	88	100.0

It is seen from this division that the most common type of meningioma was composed of fibroblasts with the tumor cells forming fibroglia and laying down collagen. It was to this group of meningiomas that Mallory's term of arachnoidal fibroblastomas was applied. Although some fibroglia and collagen fibers were found in many of the other histological types, still the predominant tissue was of another nature and hence warranted a different classification. The next most frequent and probably better known types of meningiomas were the meningotheliomatous and psammomatous varieties, which comprised almost 35 per cent of the meningiomas. The meningotheliomatous variety consists of sheets of cells in which the cell boundaries are hard to distinguish. When the cells tend to assume whorl formation within the center of which are frequently found concretions, the cell type is spoken of as psammoma. In many respects these two varieties are very similar histologically. The rest of the histological varieties of meningiomas were fairly uncommon.

It was apparent from a comparison of the case histories and the histological types, that the fibrous, psammomatous and meningotheliomatous varieties were relatively slow growing tumors. The most rapidly growing meningiomas were the mesenchymal and sarcomatous varieties with an average duration of symptoms of only 2 and 3.5 months, respectively. The slowest growing type was the osteoblastic with an average history of twelve and nineteen years in each of our cases.

## Gliomas

This group has received a great deal of attention during the past number of years due to the most enlightening contributions of Bailey on their histological structure and classification. Bailey's classification of the gliomas was first published in 1926. In spite of the numerous alterations and additions (Penfield,<sup>26</sup> Bergstrand,<sup>11</sup> Carmichael<sup>12</sup>) the classification as presented by Bailey has appeared to be the most practical and has been adopted for use in our laboratory. The percentages of each type of glioma in our studies as compared with other investigators are presented in Table IV.

It will be seen that the relative frequency of the various gliomas in most studies is fairly consistent with the exception of the astrocytomas which were somewhat more numerous in our series. This difference may easily be accounted for in the individual variation in the histological interpretations of cell type. It is very likely that some of the tumors which we were inclined to classify as rapidly growing astrocytomas have been considered by other investigators as glioblastomas.

The usual location of our gliomas have been tabulated in Table V. The greatest number occurred in the frontal, temporal, and parietal regions. The medulloblastomas were almost exclusively cerebellar tumors, while the ependymomas seemed to have the widest distribution and appeared in almost any region of the brain. Many of the tumors were so extensive as to involve more than one region and hence were included under more than one location.

The relative age distribution and age incidence of these tumors are summarized in Tables VI and VII. The age incidence was determined by calculating the frequency of the total number of gliomas in each decade compared to the total number of autopsies performed. We were forced to omit the first decade since the many stillbirths included in this age group prevented an accurate determination.

When gliomas of all types were considered they appeared with almost equal frequency during the first six decades of life. The cerebellar tumors (astrocytoma and medulloblastoma) and the ependymomas tended to occur most frequently during the earlier decades, although cerebral astrocytomas and glioblastomas were by no means uncommon during this period. If the former group of tumors were excluded, then the

## INTRACRANIAL TUMORS—BAKER

TABLE IV. COMPARATIVE FREQUENCY OF THE GLIOMAS

	Bailey <sup>5</sup>	Davidoff & Ferraro <sup>16</sup>	Gogel <sup>20</sup>	Elvidge, Penfield & Cone <sup>17</sup>	U. of Minn. Series
Total Tumors	874	36	239	211	280
Astrocytoma	255-29.2%	6-16.7%	58-24.3%	55-26.1%	127-45.4%
Astroblastoma	35- 4.0%		4- 1.7%	13- 6.2%	14- 5.0%
Spongioblastoma Polare	32- 3.7%	1- 2.8%	16- 6.7%	11- 5.2%	8- 2.9%
Glioblastoma Multiforme	218-23.8%	24-66.7%	84-35.1%	52-24.6%	71-25.4%
Medulloblastoma	86- 9.8%		23- 9.6%	28-13.3%	21- 7.5%
Oligodendroglioma	27- 3.1%	1- 2.8%	3- 1.3%	8- 3.8%	6- 2.1%
Pinealoma	14- 1.6%	1- 2.8%	11- 4.6%	2- 0.9%	6- 2.1%
Ependymoma	25- 2.9%	3- 8.3%	23- 9.6%	19- 9.0%	20- 7.1%
Neuroepithelioma	2- 0.2%		2- 0.8%	3- 1.4%	4- 1.4%
Papilloma of Choroid Plexus	12- 1.4%		6- 2.5%		1- 0.4%
Ganglioneuroma	3- 0.3%		9- 3.8%		
Undetermined	175-20.0%			20- 9.5%	2- 0.7%

TABLE V. LOCATIONS OF GLIOMAS

	Astrocytoma	Astroblastoma	Spongioblastoma Polare	Glioblastoma Multiforme	Medulloblastoma	Oligodendroglioma	Ependymoma
No. of Cases	127	14	8	71	21	6	20
Female	52	2	3	30	9	3	8
Male	75	12	5	41	12	3	12
Location:							
Frontal	40	4	1	23	1	3	5
Temporal	24	3	1	17	1		2
Occipital	14	4	1	13		2	3
Parietal	26	5	1	23	2	1	2
Basal Ganglia	14	1		9			1
Cerebellum	11		2		12		4
Midline Cerebellar	2			1	4		2
Third Ventricle	8		1	3			1
Lateral Ventricle	8		2	5			1
Midbrain	4	1	1	1			1
Optic Nerve	2						
Pons & Medulla	6		1	3			4

TABLE VI. AGE INCIDENCE OF GLIOMAS

Decade	2nd	3rd	4th	5th	6th	7th	8th & over
Autopsies	1182	2418	3223	4306	4655	4503	3737
Total tumors	29	29	41	63	40	18	4
Frequency	2.4%	1.2%	1.3%	1.4%	0.9%	0.4%	0.1%

TABLE VII. AGE DISTRIBUTION OF GLIOMAS

Decade	1st	2nd	3rd	4th	5th	6th	7th	8th or over
Cerebral Astrocytomas	9	6	14	17	30	22	9	3
Cerebellar Astrocytomas	5	4	1	2	0	1	0	0
Astroblastomas	1	2	0	3	4	4	0	0
Spongioblastoma Polare	3	0	0	1	3	1	0	0
Glioblastoma Multiforme	4	4	8	13	23	10	9	0
Medulloblastoma	8	6	3	2	1	0	0	1
Ependymoma	9	4	1	2	2	2	0	0
Pinealoma	0	3	2	1	0	0	0	0
Total	39	29	29	41	63	40	18	4

gliomas appeared most commonly during the fourth to the sixth decades.

With these general remarks, it would seem appropriate to briefly summarize some of the characteristics of the individual gliomas. De-

tailed histological descriptions will be avoided, since such excellent reports on this subject have already been published (Bailey,<sup>1,3,2</sup> Bailey and Bucy,<sup>7,6</sup> Kwan and Alpers,<sup>22</sup> Globus and Silber<sup>19</sup>).

The astrocytoma was the most common type of intracranial neoplasm comprising almost half of the gliomas and one-fourth the total intracranial tumors. It was a slow growing infiltrating tumor with a tendency to degenerate with cyst formation. The longest duration of symptoms in our series was twenty-two years, while twenty-three of the cases gave a history of three years or longer. In adults it was most commonly situated in the frontal, temporal and parietal lobes, and appeared usually during the fifth and sixth decades. In children it occurred with about equal frequency within the cerebellum and cerebral hemispheres. About 30 per cent of these tumors were cystic or associated with a cyst.

The glioblastoma multiforme was usually a rapidly infiltrating tumor arising within the white substance of the cerebral hemispheres. It presented an extreme multiformity in the size and shape of its cells and a great variation of appearance due to associated hemorrhages and necroses. It comprised about one-fourth of the gliomas and involved primarily the frontal and parietal regions of the brain. It occurred most frequently between the fourth to the sixth decades of life. The longest duration of symptoms was twelve years, while only six gave a history extending over three years. In most cases the tumor was rapidly growing and offered a life expectancy of less than one year after the onset of symptoms.

The medulloblastoma was primarily a cerebellar tumor of children. It comprised about 7.5 per cent of the gliomas. Fourteen of our twenty-one cases occurred during the first two decades of life, only one occurring as late as the fifth decade. This tumor was very rapidly growing and involved primarily the midline of the cerebellum, in which cases the life expectancy after the appearance of symptoms was less than eight months. Only 3 per cent of these tumors were cystic, the rest being fairly solid but somewhat soft and reddish.

The spongioblastoma polare was a relatively uncommon tumor. It is reported to be most common in the region of the brain stem, although in our series it occurred in widely scattered regions of the brain (Table V). This tumor occurred with equal frequency during the first and fifth decades. When occurring in the region of the base of the brain or within the posterior fossa it was usually a slow growing, fairly solid mass, one of our cases giving a definite history of involve-

ment for over twenty-three years. Those tumors appearing within the cerebral hemispheres were somewhat more active and offered a shorter life expectancy. Because of the general growth characteristics of this tumor one often wonders whether it is really composed of bipolar spongioblasts, or whether it could perhaps be an astrocytoma, which, because of some peculiarity of growth, has developed a bipolar appearance to its cells.

The ependymoma comprised 7.1 per cent of the gliomas. It appeared predominately in the younger age groups, thirteen of the twenty cases occurring during the first two decades of life. Most of the tumors were situated in the vicinity of the walls of the lateral ventricles chiefly in the region of the frontal and occipital horns. Only six occurred in the region of the fourth ventricle. In Bailey's original series, by far the greatest number were found in the posterior fossa in the vicinity of the fourth ventricle. Finckler and Coon<sup>18</sup> reported eight cases, of which five occurred in the region of the lateral ventricles. Because of their location near the ventricular system, with early production of a block in the fluid flow, the duration of symptoms was usually short. Only one case presented a history extending over five years; the remaining all lived less than eight months after the onset of symptoms. Since these tumors pathologically are usually slow growing encapsulated masses one would suspect from the rather acute clinical course that they lay dormant for a long time without producing symptoms. Because of their inaccessibility to surgery, removal is usually difficult.

The oligodendrogliomas were all slow growing tumors of the cerebral hemisphere of adults. Our cases were too few to warrant any general conclusions. A few were calcified and hence allowed for x-ray diagnosis.

The remaining glioma types occurred too infrequently in our series to warrant any general comment.

#### Vascular Tumors

In these studies the classification of Cushing and Bailey<sup>15</sup> was again followed fairly closely. These authors classified the vascular tumors of the nervous system into angiomas and angioblastomas.

The angiomas are usually considered as developmental anomalies capable of subsequent alteration in size and character. These are frequently

subdivided into venous and arteriovenous types. Because of the abnormal development and structure of the vessel walls, it is often difficult even histologically to tell whether one is dealing with arteries or veins. Since these tumors are malformations, they usually are very slow in their clinical course and appearance. One would, therefore, expect symptoms to be present over a long period of time. This was true in our cases. Of the thirteen angiomas, even though accurate histories were not obtained in all, eight presented symptoms for more than two years and three of these had symptoms for over ten years. The angiomas comprised 2.7 per cent of all the intracranial tumors. They occurred chiefly between the fourth to the seventh decades and all but three cases were found in the cerebral hemispheres. A more detailed study of these tumors will form the material for a later publication.

The angioblastomas are considered as true neoplastic growths. They were usually associated with large cysts, the tumor itself being small, reddish and solid and embedded in the cyst wall. These tumors were most frequently situated in the cerebellum (seven of our twelve cases) and produced clinical symptoms of a rapidly increasing intracranial pressure associated with some cerebellar involvement. The duration of symptoms before death or operation was surprisingly short. Lindau<sup>23</sup> in 1926 discussed the association of these cerebellar tumors with angiomas of the retina and cysts of the pancreas. He believed that angiomas of the cerebellum occurred in 20 per cent of the cases of retinal angiomas. This association of cerebellar and retinal angiomas has come to be known as von Hippel-Lindau's disease. In none of our cases was there an associated retinal angioma. The cerebral angioblastomas produced symptoms over a longer period of time than did those in the cerebellum. The angioblastomas appeared chiefly during the third and fourth decades, only one case occurring before the third decade.

#### Tumors of Mixed Tissue

These tumors are now accepted as arising from embryonic rests. If they contain tissues from all three germ layers, they are referred to as true teratomas. Only one such case occurred in our series. When tissues of mesodermal as well as epithelial origin are represented, they are called dermoid cysts. These are usually large cystic masses containing hair, teeth, bone and cartilage.

Only one such tumor was available for study and has been reported in detail (Gray<sup>21</sup>). The most common and simplest type of mixed tissue tumor is the epidermoid (pearly tumor, cholesteatoma). These are sharply circumscribed, irregular, firm and have the external appearance of mother-of-pearl. Histologically but one germ layer is represented, namely the ectoderm. These tumors are composed of a firm fibrous wall whose inner surface is lined by a layer of stratified epithelium, the innermost layer of cells often containing keratohylin granules. Often many flattened structureless cells are seen lining the innermost surface of the capsule. The interior of the epidermoids is composed of a broken down mass of debris consisting of cholesterol crystals and fatty material. Two cases occurred in our series. Both were slow growing and presented symptoms for many years. Since this compilation three more epidermoids have become available and will be incorporated in a detailed study in a separate report.

#### Hypophyseal Tumors

Both the pituitary adenomas and the craniopharyngiomas have been placed in this group of neoplasms. The latter have frequently been classified with the congenital tumors, but since no separate group of congenital tumors has been included in this study and because of the location and origin of the craniopharyngiomas it was deemed somewhat simpler to consider them with the tumors of the pituitary gland.

The pituitary adenomas, as is well known, may be of three varieties, depending upon the three types of cells found within the anterior lobe of the pituitary, namely, chromophobe, acidophil and basophil adenomas. The latter two are usually small in size and often escape postmortem detection, while the chromophobe adenomas are usually large and distort the chiasm as well as produce numerous clinical symptoms and signs. All are very slow growing, hence, the course in the patient is a long and chronic one with the patient usually drifting away from the original source of observation. For this reason there has been a great scarcity of postmortem tissues available for study. Since the location of these tumors does not lend itself for satisfactory surgery, operative procedures have been avoided unless the rapidly progressive loss of vision or the profound incapacitating headaches have forced such a procedure. Of late fragments of considerable number



of pituitary adenomas have been removed through operative procedures and reported by various authors. In our series the actual number of histologically verified adenomas has been very few (ten of twenty-two cases). In order, however, to balance our statistical studies we have checked our clinical case histories of intracranial tumors and have included twelve cases in which x-ray investigations have definitely substantiated the presence of an adenoma of the pituitary. This produces a total of twenty-two pituitary adenomas or 4.6 per cent of the total intracranial neoplasms, as compared to 17.8 per cent in Cushing's series where operation was more frequent and where no doubt as regards this type of tumor, the material was somewhat selective. In most other series, the percentage follows fairly closely those quoted in this study.

The craniopharyngiomas or pharyngeal duct tumors are usually large irregular growths situated at the base of the brain, often extending upward into the third ventricle. They are usually firm tumors with a well defined capsule. Many are calcified, as well as cystic, containing a viscid yellow fluid. These tumors by their growth compress and destroy the pituitary as well as the optic chiasm and floor of the third ventricle. For purposes of description the craniopharyngiomas have been divided into the adamantinoma and the Rathke Pouch tumors.

The adamantinomas are composed of epithelial columns and are said to resemble the embryonic enamel organ. Twelve such tumors occurred in our series. The duration of symptoms was extremely short as judged from the histories. All but two presented symptoms for six months or less prior to death or operation, while the remaining two presented symptoms for one year and five months respectively. It is generally stated that these tumors occur in the younger age group. This was not entirely substantiated in our studies in which eight of the twelve cases occurred during or after the fourth decade. The majority of cases occurred in the fourth and fifth decades. Our youngest case was six years of age with symptoms having appeared one year previously.

#### Granulomata

In this group are placed the tuberculomas and the gummas. In our series, these comprised 6.3 per cent of all the intracranial neoplasms. This figure is a little higher than is found in most

other series (Bailey and Cushing, 2.3 per cent; Gogel, 1.4 per cent).

The tuberculomas were four times as frequent as the syphilomas, comprising 80 per cent of all the granulomas. Tuberculomas are uncommonly observed in a general hospital. In most studies the greatest incidence of tuberculomas have been in children. This does not seem to follow in our studies where fifteen of the twenty-four cases occurred during or after the third decade, only seven cases appearing during the first nine years of life. The highest incidence of occurrence was during the third decade in which eight cases appeared. It has been frequently stated that one of the most common locations of a solitary tuberculoma is in the cerebellum. Only eight of our total cases occurred in this organ. Thirteen were found in different regions of the cerebral hemispheres excluding the basal nuclei which alone contained four. Treatment was limited because most of these tumors were either inaccessible or multiple. Surgical removal even in accessible tumors is often inadvisable because it is frequently followed by a meningitis which is invariably fatal. Only four of our cases contained multiple lesions.

Gummas are extremely rare occurrences. Our series contained six cases, all of which were found in the cerebral hemispheres. In recent years due to the intensive antiluetic therapy, this type of lesion has become a medical and pathological curiosity.

#### Miscellaneous Tumors

Such tumors as colloid cysts of the third ventricle, true cysts usually cerebral in origin, fibroblastomas and chordomas were included in this group. The number of such tumors in our series were too few to warrant discussion. We have studied two fibroblastomas of the brain, both of which have been reported in detail (Baker and Adams,<sup>10</sup> Cottrell<sup>13</sup>).

The metastatic brain tumors are not included in the present statistical analysis, but will form the subject of a future report.

#### Summary

1. A statistical study of 467 histologically verified intracranial tumors is presented.
2. Eighty-five per cent of the neoplasms were obtained at autopsy, hence, allowing for a careful investigation of the varying histology in the different portions of the tumor.



3. An attempt is made to correlate the various histological types of tumors with the age of the patient, the location within the brain or intracranial cavity and the rapidity of growth.

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## SMALL CARCINOMATOUS GASTRIC LESIONS SIMULATING CHRONIC BENIGN ULCER: PRESENT STATUS OF DIFFERENTIAL DIAGNOSIS AND TREATMENT\*

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**E**VEN in this unprecedented era of scientific progress the medical profession cannot view with complacency the fact that 75 per cent of the patients with gastric carcinoma come to the surgeon too late for successful operation. Increased ability to diagnose early gastric carcinoma can be obtained only by more respectful consideration of the accepted precursors of this disease namely, gastric polyps, ulcers and chronic inflammatory changes in the gastric mucosa, and prompt recourse to roentgenoscopic and endoscopic examination of each patient more than thirty-five years of age who suffers from digestive disturbances, however mild, or has lost weight for some unexplainable reason. It is apparent that the rank and file of the medical profession are becoming increasingly conscious of the fact that small or circumscribed, innocent looking ulcerous gastric lesions may be actually or potentially ma-

lignant. Progress in our knowledge in this respect so far is due largely to the disclosures of the fluoroscopic room and the unexpected results of histologic examination of presumably benign excised lesions or lesions in resected portions of the stomach.

If a physician is confronted by a patient harboring a small ulcerating gastric lesion which the roentgenologist has been able to visualize, how may he best determine its possible natures that he may carry out that procedure which will serve the patient's best interests? Obviously, in the absence of a specific biologic test for carcinoma, certain symptoms and signs, or what is more to the point, a grouping of certain symptoms and signs, must be depended on to point the way.

Although it seems logical at the outset to consider the significant features elicited by the anamnesis and gastric analysis, it is really more practical to evaluate the objective evidence presented by the roentgen film. If the patient's phy-

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sician is fortunate enough to have the coöperation of an experienced roentgenologist his opinion should be considered first because he may have made significant observations during the fluoroscopic examination that cannot always be depicted on the ordinary film. He may or may not have a positive opinion regarding the nature of the process.

### Significance of Roentgenologic Examination

Two types of malignant gastric lesions may masquerade as chronic benign ulcer, namely, the small ulcerating carcinoma and the less frequent carcinomatous ulcer. The latter is an ulcer without evident tumefaction but which on microscopic examination proves to be carcinoma. In ulcerating carcinoma the cavity produced by the ulceration is usually situated well within the normal confines of the gastric lumen. If the meniscus complex described by Carman and Kirklin, which consists of a meniscal form of crater encircled by a transradiant zone representing the approximated overhanging border, can be demonstrated, the lesion almost invariably proves to be malignant. The crater of a carcinomatous ulcer, like that of a benign ulcer, is sculptured as a niche in the gastric wall and invariably projects beyond the normal outline of the lumen. If this niche is large, that is, in excess of 2.5 cm. in diameter, if there is an absence of gastrosplasm and of tenderness on pressure, and if the adjacent rugæ are obliterated or if the margin of the niche is sharply conical or has an irregular profile, then the roentgenologist usually regards the ulcer as carcinomatous. A large niche without these associated features would even be looked on with some suspicion. My roentgenologic colleagues, in the interest of the patient's welfare, lean over backward to regard large size or any irregularity of the lesion as signifying its actual or probable malignant nature. This is evidenced by the latest statistical study, indicating that in 26 per cent of cases in which the lesion was diagnosed by the roentgenologists as questionably malignant the condition was actually benign.

Unfortunately a small carcinomatous ulcer with a small niche may have all the other roentgenologic characteristics of benign ulcer. In the review of a large series of cases, 7 per cent of the lesions unequivocally diagnosed in recent years as benign ulcer by my roentgenologic colleagues were actually carcinomatous.

### Significance of Situation and Size of the Lesion

The situation of the lesion is of relative significance in differential diagnosis because lesions that are near the pylorus, on the greater curvature, or well up on the posterior wall of the stomach, have a greater tendency to be carcinomatous than those on the lesser curvature. In our experience at The Mayo Clinic the size of the lesion has a definite bearing on diagnosis, although I realize that this aspect of our problem is still controversial. According to MacCarty,<sup>11,12</sup> the average diameter of carcinomas of the stomach excised at The Mayo Clinic up to 1931 was 6.1 cm. From 1918 to 1937, inclusive, out of 1,978 carcinomas removed at operation, according to this observer, 128, or 6.5 per cent, of these were small carcinomas (2.5 cm., or smaller, in diameter). By way of comparison, 3,358 cases in which a diagnosis of gastric ulcer was verified either by roentgenologic examination or operation, came under our observation during the same period. In 2,324, or 69 per cent, the ulcer was removed at operation and histologically verified. Alvarez and MacCarty (1928) showed that although the excised benign ulcer is comparatively small, 79 per cent of them being smaller than a dime (1.8 cm. in diameter) and 92.3 per cent smaller than a quarter (2.4 cm. in diameter), 23 per cent of the carcinomas removed were within the size range of benign ulcer (4 cm. or less in diameter). On the basis of the observations of Alvarez and MacCarty my roentgenologic colleagues consider any lesion more than 2.5 cm. in diameter as carcinomatous until proved otherwise. There are, of course, frequent exceptions to the rule. It is apparent that the great majority of benign lesions and thus far a minority of carcinomas are of small size.

From a study of 135 carcinomas and 513 benign ulcers, in which the upper limit for the diameter of the lesions was 4.4 cm., Comfort and Butsch found that on the basis of incidence alone a resectable lesion had approximately four chances out of five of being benign.

### Significance of Symptoms

To what extent does a case history contribute to differential diagnosis? The majority of benign gastric ulcers are accompanied by the classic syndrome of ulcer, although not to the same degree or with the same frequency that characterized

duodenal ulcer. A typical history of ulcer favors benign ulcer but does not exclude the possibility of a malignant lesion; contrariwise, an irregular or nonulcer type of history does not exclude the possibility of a benign lesion being present. A change in symptoms in the absence of demonstrable complications, such as pyloric obstruction, penetration, or perigastric involvement, implies, but does not necessarily signify, carcinomatous transformation. Thus, it will be seen that the symptoms per se are only of secondary value in the differential diagnosis. Naturally, in scrutinizing and appraising symptoms, the age of the patient, duration of symptoms and the findings on gastric analysis are considered. Here the observations of Comfort and Butsch are again enlightening. They showed that whatever the duration of the symptoms, the type of history, or the concentration of free hydrochloric acid, and whether or not a change in symptoms has occurred, or gastric retention, or occult blood is present in the gastric contents, a gastric lesion within the size range of most benign ulcers is benign more frequently than it is malignant. "This is especially true when the patient is less than thirty years of age (odds 20:1), when the symptoms are of the ulcer type (odds 5.6:1), when the symptoms are of ten years' duration or longer (odds 12:1), and when the concentration of free hydrochloric acid is greater than 60 clinical units (odds 51:1)."

Further observations with reference to sex, age at time of onset, gastric secretory and motor status and results of examinations of the stool are of interest. Gastric carcinoma and peptic ulcer are three times more frequent among men than among women forty years of age or older; in spite of this fact studies at the clinic have demonstrated that sex does not aid materially in determining whether the lesion is benign or malignant. The difference in the average age of patients with small carcinomas (52.9 years) and with ulcers (48.5 years) is too small to be of any value. We have found, however, that although the incidence of ulcer is greater than that of carcinoma in all decades, ulcer is twenty times more prevalent than carcinoma in the third decade of life. Advanced age and recent onset of symptoms characterize many cases of carcinoma of all types and sizes. One significant combination of circumstances, advanced age, recent onset, reduced acid titer, especially histamine refractory

achlorhydria, irrespective of the size of the lesion, favors a diagnosis of malignancy. The added feature of pyloric obstruction and achlorhydria almost invariably point to malignancy.

Systematic examination of the feces for occult blood under controlled conditions should be a routine procedure, especially when the patient is undergoing treatment in the hospital. Gutmann and his associates, in their recently published volume devoted exclusively to early gastric carcinoma, regarded this procedure as next in importance to the roentgenologic examination. The continuous presence of occult blood after two to three weeks of treatment makes necessary the exclusion of carcinoma; persistent absence of occult blood from the stools is a strong indication of a benign lesion, although it does not entirely exclude carcinoma.

#### Significance of Gastroscopic Findings

From our experience at the clinic it is not yet clear to what extent gastroscopic examination is helpful in distinguishing between small ulcerous types of carcinoma and chronic benign ulcer. Schindler has maintained that this examination is a valuable procedure and he has described differential aspects of carcinoma and benign ulcer. He stated that the gastroscopic appearance of a lesion may at times be more informative than the observations of the surgeon or pathologist concerning the gross specimen, and second in importance only to the microscopic examination. He has attributed this advantage to the high relief pattern and the brilliantly colored appearance of the living tissue in the gastroscopic picture due to the presence of circulating blood. Palmer, with whom Schindler recently has been associated closely, has expressed the belief that the gastroscopic examination is of great differential value in experienced hands but that it is by no means infallible. It is the better part of wisdom to submit to gastroscopic examination all patients who harbor lesions in which malignancy cannot be excluded, especially if such patients are not going to be promptly submitted to operation.

#### Significance of Results of Medical Treatment

Regardless of opinions to the contrary, the results of adequate medical treatment are only less decisive in distinguishing a benign from a circumscribed malignant process than surgical removal and histologic examination of the lesion.

I say this with full cognizance of the fact that the physician may be lulled into a false sense of security as the result of such treatment. In the first place, relief from symptoms, even though complete for the time being, is no criterion of

three days later. The gastroscopic appearance was that of a small benign lesion on the lesser curvature and anterior wall distal to the incisura angularis.

The patient was hospitalized and underwent intensive treatment for more than a month. Roentgenologic examination was repeated April 18, 1938, but this failed



Fig. 1. Appearance of stomach: *a*, March 28, 1938, shallow crater on lesser curvature slightly below angle of stomach; *b*, April 18, 1938, crater of ulcer not visible, but area of induration at site of former crater; same picture June 2, 1938; *c*, January 17, 1939, small filling defect of recurrent ulcerating lesion just below angle of stomach; malignancy cannot be excluded.

benignancy. Neither is progressive diminution of the niche, and in *rare* instances, neither is its complete disappearance even when confirmed by roentgenologic and gastroscopic examination, as illustrated by the following case.

*Case 1.*—A man, aged sixty-eight years, came to The Mayo Clinic on March 21, 1938, because of stomach trouble. In 1923 and 1928 he had experienced brief periods of gastric distress coincident with unusual nervous and physical strain. This distress, which was characterized as gas, and hunger pain, was situated in the epigastrium and appeared about two hours after each meal. On relief from occupational stress the symptoms promptly disappeared. The present illness began about three months prior to his admission to the Clinic, during the Christmas holiday (December, 1937). Epigastric distress appeared about one hour after each meal and persisted for several hours. Alkalis or milk afforded relief. There was no impairment of weight, appetite or strength. In February, 1938, a gastric ulcer was diagnosed after a roentgenologic examination. Ambulant treatment for ulcer was promptly instituted and the symptoms disappeared. Because there was not a proportionate improvement in the roentgenologic appearance of the lesion, the patient was referred to the clinic for an opinion.

The general physical examination gave satisfactory results. The patient was short, stocky and well nourished. Gastric analysis following an Ewald meal revealed a total acidity of 32 clinical units and free hydrochloric acid, 20. The total contents removed measured 125 c.c. Roentgenoscopic examination on March 28, 1938, revealed a shallow ulcer on the lesser curvature just below the incisura angularis (Fig. 1*a*). Its presence was confirmed by gastroscopic examination

to disclose any sign of the ulcer (Fig. 1*b*). On gastroscopic examination on July 7, 1938, the original ulcer had disappeared completely. Roentgenologic examination on September 14, 1938, again revealed normal conditions. The patient had experienced none of his previous distress in the meantime. He was, however, asked to return periodically for reexamination on account of his advanced age and the recent onset of the symptoms. On January 17, 1939, there was roentgenologic evidence of a recurrence of the ulcerating lesion (Fig. 1*c*). Two days later gastroscopic examination revealed the lesion as depicted on the film. It was situated at the original site and appeared to be fairly well circumscribed, somewhat indurated, and 2 cm. in diameter. On June 25, 1939, partial gastrectomy was performed.

The pathologic findings were as follows: An ulcerating colloid carcinoma grade 3, measuring 2 by 2 by 1 cm. situated on the anterior wall and lesser curvature of the stomach, 3 cm. above the pyloric ring. The serosal surface of the stomach immediately underlying the ulcer showed carcinomatous lymphangitis. No lymphatic involvement was found (Fig. 2).

The patient was examined again on February 13, 1940, and appeared to be in excellent health. He had no disturbances of any kind and the examination failed to reveal any evidence of recurrence.

Templeton and Schindler recently reported that in five of a series of eighteen cases which had been carefully observed during medical management, and in which from a roentgenologic standpoint the lesion apparently had healed, shallow craters were still present on gastroscopic examination. It seems, therefore, that gastroscopic confirmation of roentgenologic evidence of complete healing is essential. However, with few ex-



ceptions, the complete and permanent disappearance of all symptoms and signs that can reasonably be attributed to the ulcer is usually reliable evidence of its benignancy. On the other hand, some sclerosed, indurated or perforated benign lesions will not heal, and the niche may persist in whole or in part. Even an uncomplicated ulcer may undergo complete healing, with persistence of the niche, as demonstrated by Unger and Poppel. That this should not occur oftener has frequently intrigued me when one considers the fact that the bulbar deformity caused by most duodenal ulcers will persist after such ulcers are healed. Small ulcerating carcinomas usually undergo few morphologic changes as a result of treatment. In some the crater actually enlarges. In rare instances, as pointed out by Rigler, the niche may disappear roentgenologically because the carcinoma has grown into the base of the ulcer. Occasionally the crater of lesions eventually proved malignant decreases in size, but as a rule the other signs, occult bleeding for example, or the symptoms, or both, may persist or recur within a short period.

The necessity for periodic reexamination of patients who have had medical treatment only is important at all times and especially when such patients are past middle life. The possibility should be kept in mind that patients with chronic ulcers may undergo treatment at a time when the carcinomatous changes in the ulcer are microscopic and therefore an apparent cure may be secured temporarily. In MacCarty's experience the smallest carcinomas involve only the mucosal borders of the ulcer. This observer is also of the opinion that approximately 10 to 15 per cent of all chronic gastric ulcers undergo early and late changes which cannot be detected by any procedure other than microscopic examination. The necessity for further adequate supervision of patients treated medically is indicated by the fact that even these small lesions may be highly malignant and therefore their true nature should be determined without unnecessary delay. This fact was strikingly exemplified in the case reported by Rivers and Dry, of a young man aged twenty-seven years, who had two gastric lesions, the smaller one being carcinomatous. Balfour stated that the five-year survival of patients who had large malignant lesions of the stomach (60 sq. cm.) after operation was 10 per cent more than that of patients who had small malignant lesions

(20 sq. cm.). In explanation of this he concluded that the smaller lesions are more likely to be of a penetrating character and of a higher degree of malignancy than the larger ones. Among sixty-eight patients with small carcinomas or carcino-

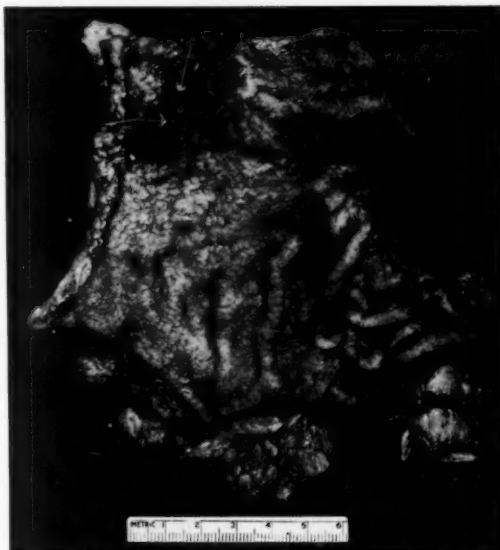


Fig. 2. Ulcerating colloid carcinoma measuring 2 by 2 by 1 cm.

matous ulcers observed by Alvarez and MacCarty, thirty-six, or about 53 per cent, were dead within one and a half years following operation, presumably of recurrences.

It seems appropriate to revert to the moot subject of the relation of ulcer to carcinoma. That chronic ulcers, like adenomatous polyps, and chronic gastritis are the precursors of carcinoma is generally accepted today. There is considerable difference of opinion as to the incidence of carcinoma in ulcers. A minority of investigators, such as Palmer and Klein, take the extreme viewpoint that an ulcer rarely, if ever, undergoes carcinomatous transformation. With such an irreconcilable viewpoint we at the clinic cannot agree, on the basis of our own clinical and pathologic evidence. In a critical study of the histories of eighty patients who had undergone gastric resection for small ulcerous malignant lesions, Eusterman and Bueermann noted that 52 per cent of the patients had presented symptoms characteristic of benign ulcer with an average duration of such symptoms of eleven years. Eighty-two per cent of these had free hydro-

chloric acid in the gastric content. To ascribe such antecedent symptoms to nervous indigestion or other unlikely causes is, to my mind, begging the question. To what extent such symptoms could be ascribed to gastritis remains to be proved. In this connection, Konjetzny's well known observations in this field lead him to believe that carcinoma may develop in the edge of a benign ulcer or adjacent to the ulcer, but independent of it, related not to the ulcer, but to the gastritis, to which this authority attributes both the ulcer and the carcinoma.

A reasonable question is why not operate at once in every instance? In the first place, the great majority of small gastric lesions are benign, and many of the uncomplicated gastric ulcers heal readily. It is reasonable to presume that complete healing forestalls eventual carcinomatous changes. In the second place, as emphasized by Bloomfield and many other internists before him, gastric resection in the hands of the average surgeon is attended by a mortality sufficiently high so that the outlook for the patient will not be improved unless the menace of carcinoma exceeds the operative risk.

### Summary and Conclusions

Carcinoma in its earlier stages is still diagnosed too infrequently. Circumscribed innocent looking ulcerous gastric lesions may be actually or potentially malignant. Satisfactory differential diagnosis, in the absence of a specific biologic test for carcinoma, is frequently impossible without recourse to microscopic examination of the lesion. On the basis of repeated clinical and pathologic observations, certain diagnostic criteria of relative or absolute value in differential diagnosis have been evolved.

The typical benign ulcer is small, usually not exceeding 2.5 cm. in diameter, and has certain familiar roentgenologic characteristics. When the patient is thirty years of age or less, a small ulcerous lesion associated with 40 units of free hydrochloric acid in the gastric contents after the Ewald meal is usually benign. A concentration of free hydrochloric acid of 60 or more clinical units (Ewald) also strongly favors benignancy. The benign nature of the lesion is also characterized by the permanent disappearance of all symptoms and signs following adequate medical treatment, irrespective of age, nature or duration of symptoms, or size or location of the lesion.

Although about a fifth of all malignant gastric lesions may be within the size range of benign ulcer (4 cm. or less in diameter) only 6.5 per cent of carcinomas are small ones (2.5 cm. or less). At least 5 per cent of lesions unequivocally diagnosed in recent years by our roentgenologists as benign ulcer were actually carcinomatous. The meniscus complex for all practical considerations is pathognomonic of ulcerating carcinomas, irrespective of size. The roentgenologic characteristics of carcinomatous ulcer are less definitive than the meniscus complex. Large niches are regarded with suspicion, but a large ulcer is not necessarily malignant. Other features suggestive of the possible malignant nature of the lesion are an elderly patient with late onset of symptoms, the combination of histamine refractory achlorhydria and pyloric obstruction, persistent occult blood in the stool during and after treatment, incomplete response to adequate treatment, and situation of the lesion near the pylorus, on the greater curvature or posterior wall, as well as certain features elicited by the gastroscopic examination.

The presence of a gastric lesion, however small, makes imperative adequate medical treatment and observation, if exploratory operation is not undertaken. This applies in particular to the middle-aged or elderly individual. Treatment is justifiable when the lesion is not frankly malignant as the majority of uncomplicated gastric ulcers heal readily under favorable conditions, and gastric resection, under average conditions, still carries a much higher mortality than the risk of death from carcinoma. The nature and degree of response to treatment are also important factors in differential diagnosis.

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## THE SURGICAL TREATMENT OF GASTRIC CANCER MASQUERADING AS BENIGN DISEASE\*

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THE frequency of malignant lesions in the stomach in contrast to their rarity in the duodenum brings to gastric ulcer a special significance. Only constant recollection of this fact leads to rational treatment of such lesions. Though the gastric ulcer is less commonly encountered in clinical practice than duodenal ulcer—according to Eusterman and Balfour<sup>1</sup> one-twelfth as often at The Mayo Clinic—its presence is sufficiently common to deserve careful attention. In 1938<sup>10</sup> at The Mayo Clinic a diagnosis of gastric ulcer was made in 178 cases and operation was performed in eighty-four, or 47.2 per cent. In the same year a diagnosis of duodenal ulcer was made in 2,215 cases and operation performed in 328, or 14.8 per cent. In 1939 there were 207 patients for whom a diagnosis of gastric ulcer was made and 109 were operated on, an incidence of 52.6 per cent. In 1939 a diagnosis of duodenal ulcer was made in 2,729 cases and operation carried out in 467, or 17.1 per cent. Unfortunately, too often gastric and duodenal ulcers are grouped under the misleading title of "peptic ulcer" and their inherent dissimilarities are neglected. They are thus not recognized as occurring in individual types of tissue in which there is a difference both in pathologic reaction and in response to medical and surgical treatment.

A large, chronic gastric ulcer (more than 2.5 cm. in diameter) in a patient more than forty years of age, especially if the complications of perforation, obstruction or hemorrhage have

been present, or one on the greater curvature or near the pylorus usually should be removed surgically without delay, as few of these lesions respond to nonsurgical treatment and many of them may be carcinomatous. The small gastric ulcer which has failed to heal or has recurred under adequate medical management should be removed surgically, for, if the lesion is malignant, it is frequently of high degree.

The incidence of malignant changes in gastric ulcers has been estimated to be from 10 to 20 per cent. Katsch found an incidence of 20 per cent, and Walton stated that the figures of Stewart are generally accepted, namely, that 9.5 per cent of chronic gastric ulcers became carcinomatous and that 17 per cent of cases of carcinoma of the stomach originated in chronic ulcer. Walton called attention, however, to a probable higher incidence in view of the fact that many of the carcinomas, when removed, are found to be so large that it is impossible to tell whether they might have originated in an ulcer or not. In a recent study<sup>9</sup> at The Mayo Clinic of 100 consecutive cases in which small, presumably benign gastric lesions were removed, the lesions in nineteen were found to be carcinomatous on pathologic examination.

There are several satisfactory procedures that may be employed in the surgical treatment of gastric ulcer. The procedure of choice is partial gastrectomy with removal of the lesion. The advantages of this procedure are the removal of the lesion with its possible hemorrhage, perforation or malignant degeneration, riddance of associated pylorospasm and induction of a high incidence of relative achlorhydria with almost total

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absence of gastrojejunal ulceration. The Polya type of end-to-side anastomosis posterior to the colon is utilized most frequently. If the lesion should prove, on microscopic examination, to be malignant, its removal by partial gastrectomy gives the patient the best chance of cure, for it removes the lymphatic regions in the wall of the portion of the stomach removed and in the adjacent gastrocolic and gastrohepatic omenta, which might harbor malignant cells which extended from the original lesion.

The Billroth I type of anastomosis after partial gastrectomy is a satisfactory treatment of gastric ulcer and carcinoma in selected cases. It is particularly useful in instances in which the duodenum is mobile and the lesion is in the pyloric one-third of the stomach, for, under these circumstances, the end-to-end anastomosis can be made without tension on the suture line. The risk of performing this operation in the experience of some surgeons has been somewhat greater than that of the Polya type of resection unless the cases are carefully chosen. It was noted by one of us (Walters) and Clagett in a study of 272 consecutive operations for gastric ulcer performed at The Mayo Clinic that this procedure was used but twenty-two times in contrast to the Polya operation, which was used 131 times. It should be emphasized that the satisfactory results from the Billroth I procedure for gastric ulcer are not duplicated in as high a percentage of cases as in operations of similar type for duodenal ulcer. This is probably due to the fact that the Billroth I operation produces a relatively high incidence of postoperative achlorhydria in gastric ulcer and does not in duodenal ulcer.

When partial gastrectomy cannot be safely utilized, on account of the poor general condition of the patient or the nature of the lesion itself, surprisingly good results may be obtained by less radical methods, such as excision of the ulcer with gastro-enterostomy or occasionally by excising the ulcer alone. It is to be repeatedly emphasized that, when possible, removal of the lesion in some manner should be done. Finsterer, in a study of 532 consecutive resections for gastric ulcer, found 141 lesions to be carcinomatous. Of these 141 carcinomatous lesions he found forty-one which he could not macroscopically distinguish from benign ulcer, and only by pathologic study was the sinister na-

ture of the lesion brought to light. By local excision of the ulcer with knife or cautery and gastro-enterostomy, pathologic study of the lesion to tell its exact nature is possible, and protection against further ulceration is accomplished by reduction of acidity by the gastro-enterostomy. This was done fifty times with very good results in the series of 272 cases studied by one of us (Walters) and Clagett.

Excision with knife or cautery may occasionally be done without gastro-enterostomy but it is not recommended because it does not offer an alteration in gastric physiology to prevent recurrence.\* In the occasional case it has been utilized with rather surprisingly good results. It does enable microscopic study of the lesion. Similarly, segmental or sleeve resection may be done to remove the lesion, but disturbance in gastric peristalsis may follow in its wake, in addition to the fact that little change in gastric physiology results. It has been used with some success in selected cases, however.

When the condition of the patient is such that removal of the lesion is impossible without too great risk, then as safe a procedure as possible should be done which sufficiently alters the conditions that healing of ulceration may be anticipated. No one by choice desires to leave behind a gastric ulcer with the menace of malignancy in it, but if survival of the patient is deemed impossible with its removal, some less satisfactory procedure must be done. In this predicament, providing the lesion is benign, experience at the clinic has shown that gastro-enterostomy may be satisfactory. With the relative achlorhydria which frequently follows, a recalcitrant gastric ulcer<sup>1</sup> may heal with this alone. Eusterman and Balfour showed that 79 per cent of 100 patients on whom gastro-enterostomy had been performed for gastric ulcer were well after five years. This procedure of low risk, 3.9 per cent for 540 cases according to Eusterman and Balfour,<sup>2</sup> is thus worthy of consideration when conditions make removal impossible. The palliative resection of Madlener, in which the ulcer is also left behind, has not been utilized at the clinic. Lewisohn says the results of the Madlener operation, when viewed in a large series, are unsatisfactory. Jejunostomy is not utilized because of the necessity of prolonged treatment and fre-

\*Reduction of gastric acidity and relief of pylorospasm.



quency of recurrence of the ulcer following discontinuance of the jejunal feedings.

### Results of Operation

The results from well-chosen surgical treatment of gastric ulcers are among the best in surgery. In forty-three of sixty-two patients with benign gastric ulcer, or approximately 70 per cent, operated on at The Mayo Clinic in 1938, partial gastrectomy was performed with one death, or a mortality of 2.3 per cent.<sup>10</sup> Most of these procedures were of the posterior Polya type. One of us (Walters) and Clagett in a study of 272 patients with gastric ulcers operated on between January 1, 1933, and January 1, 1937, found that 131 patients with gastric ulcer had the posterior Polya type of resection. Of the 131, eighty of eighty-five patients who responded to the questionnaire and had this type of operation were in excellent health without distress, while five were in good health with only slight occasional distress.

The high location of a gastric ulcer should not prejudice against surgical treatment, when surgical management is indicated. We have shown that many of the benign cardial gastric ulcers can be removed with a risk of less than 4 per cent, in other words, not appreciably greater than for removal of ulcers in the body of the stomach. For example, thirty-five benign cardial gastric ulcers were treated surgically with one death at The Mayo Clinic in 1938 and 1939 (mortality 2.8 per cent). The cardial gastric carcinomas, of which there were thirty-four in 1938 and 1939 with five deaths (14.7 per cent mortality) were removed by partial gastrectomy with a risk comparable to that of resection for carcinoma of the stomach in general. For comparison, 126 partial gastrectomies were performed for carcinoma of the stomach at The Mayo Clinic in 1938 with a mortality of 13.4 per cent. Often the ulcerating gastric lesion appears to be located higher in the roentgenogram than it actually is, because perforation of the ulcer onto the capsule of the pancreas or gastrohepatic omentum may foreshorten the stomach proximal to the lesion. In such cases high ligation of the gastric artery, division of the gastrohepatic omentum above the lesion and mobilization of the perforating lesion usually demonstrate an adequate amount of stomach available for safe resection. Thus, any patient

with gastric ulcer for which surgical intervention is thought best should not be deprived of the benefits of operation because the lesion seems to be high, on roentgenographic or gastroscopic examination.

### Summary

Gastric resection is the surgical procedure of choice in the management of gastric ulcer and the best results follow the posterior Polya type of partial gastrectomy. Removal of the lesion should be accomplished wherever possible; a simple excision, combined with gastro-enterostomy, gives very satisfactory results when the lesion is benign but cannot be safely removed by partial gastrectomy. When the lesion seemingly cannot be removed with safety, gastro-enterostomy is favored over the Madlener palliative resection or jejunostomy. The results of a properly performed, well-chosen surgical procedure for chronic gastric ulcer are among the best in surgery today, and no patient should be deprived of surgical treatment because of the large size of the lesion or its apparent inaccessibility when viewed radiographically, for such lesions may be more accessible than the roentgenologic examination would indicate. The preoperative differential diagnosis between a benign and a malignant ulcer is difficult and the roentgenologic report that a gastric ulcer is present does not exclude the possibility that it may be malignant. In fact, in 100 consecutive cases of reported "gastric ulcer" the lesion was found to be carcinomatous in nineteen.

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## INDICATIONS FOR USE OF IRON IN TREATMENT OF THE ANEMIAS\*

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THE work of Whipple, Castle, Rhoads and a host of others has given clinicians a great deal of light on much that pertains to normal and abnormal erythropoiesis. There is still a place, however, for clinicians to introduce into practice an orderliness in applying these gifts of researchers. Obsolete and confusing nomenclatures must be gradually displaced. The terms "primary" and "secondary" as applied to anemias should be used with greater discrimination. Addison's anemia is no longer "pernicious" but has been established as a deficiency disease in a conditioned individual. When an accurate diagnosis is followed up with adequate and persistent fortification of the diet with the deficient factor as represented by gastric or liver extract, the patient will remain well. A variety of other conditioning and nutritional interruptions account for a series of anemias of nearly identical type.

In a similar manner the investigations of Whipple and Robschey-Robbins<sup>13,14,15</sup> on the diet and iron requirements of their "standard anemic" dogs have illuminated to a remarkable extent the problem of the large group of anemias associated with hypochromia and iron deficiency. Such terms as "primary" or "idiopathic hypochromic" anemia are likewise doomed to become obsolete since the circumstances attendant upon iron metabolism, bodily storage, availability, and sources of iron loss have become so thoroughly understood.

A combination of these types of anemia, representing both maturing and iron deficiency factors, occurs uncommonly. Thus we may say that the therapeutic indications on the one hand to stimulate red cell maturation and on the other to adequately stock the body with sufficient iron for hemoglobin production, are so definite as to make the various combinations of liver extract and iron as illogical as they are expensive. An individual in whom liver therapy is indicated will need continuous and persistent treatment during life. This situation does not obtain in the iron deficiency group for once the reserve has been replenished and causal factors eliminated, the ne-

cessity of further treatment ceases. Furthermore, the use of such combinations greatly increases the probability of inadequate dosage of whichever factor chances to be the required one.

I propose to hold this discussion to the several circumstances which lead to depletion of the iron stores in the body. This will involve consideration of dietary deficiencies, of disturbed absorptive facilities, of liver inadequacy in its relation to hemoglobin protein metabolism, and finally of the channels through which body iron is lost. Where such circumstances obtain, the most common of all blood conditions—hemoglobin deficiency anemia—results.

The hemoglobin molecule is large and consists of two component parts. Hematin, the smaller of these, carries all the hemoglobin iron combined with its protein. It has been shown that the body is able to synthesize all material necessary in the formation of new hemoglobin except iron. Some highly significant investigations have recently been reported by Whipple<sup>12</sup> demonstrating that certain relationships exist between hemoglobin proteins and the plasma and fixed tissue cell proteins. By starvation experiments with his standard anemic dogs, he was able to show that during such stress an important exchange of proteins would occur from the tissue cells to the hemoglobin and that this reaction was not reversible. The rôle played by the liver in this exchange of protein from tissue cells and plasma to hemoglobin, appears to be that of an important assembling and distributing station. He demonstrated, furthermore, that the plasma and hemoglobin proteins in these dogs were controllable by diet and that certain foods have a specific effectiveness in stimulating the production of new hemoglobin. In view of such observations one may emphasize the therapeutic importance of a quantitatively as well as qualitatively adequate protein intake.

Although minute traces of iron are known to be present in all tissue cells, the bulk of this element is contained in the circulating hemoglobin. It has been estimated that the normal adult human body contains an approximate total of four and one-half or five grams of functioning iron.

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Of this total, approximately ten per cent is tissue cell iron and sixty per cent is combined in hemoglobin. The remaining thirty per cent, about one and one-half gram in amount, is stored in available depots as the liver, marrow, and spleen, to be used in the production of new hemoglobin as need arises. This then represents the so-called normal iron reserve. Other iron deposits may be found in body tissues and organs in an entirely non-functioning capacity. In conditions as hematochromatosis and in hemosiderosis, these foreign-body-like deposits may be very extensive, but do not under any known circumstances become available for use.

The iron conserving mechanism of the body is equally remarkable in that none of this iron reserve is lost in any appreciable degree through excretion. When hemoglobin disintegrates to form bilirubin and the other bile pigments, the iron bearing hematin is split off early in the process to be conserved within the body and apparently reutilized in the formation of new hemoglobin. What, then, are the sources of loss of iron from the body, and through what channels may this reserve be depleted? We may say specifically that this may occur only through the processes of bleeding, of pregnancy and lactation, and of growth.

To lose hemoglobin through blood loss is to lose iron. By simple calculation one can assume, theoretically at least, that a normal individual, having lost one-half of the blood in the body through acute hemorrhage, may restore the blood level to normal without receiving any iron from extraneous sources. This would be accomplished, of course, at the expense of the entire iron reserve; and the replenishment of the same would become the immediate physiological problem. More insidious depletion ensues as a result of chronic and recurring blood loss. The anemia-producing effect of daily bleeding from hemorrhoids and from gastro-intestinal malignancies is generally known. The commonest instance, however, is menstrual bleeding with its almost universal depression of hemoglobin values during this period of life. Minot<sup>7,8</sup> states that the iron requirement in women during their menstrual life is four times that of men. It seems entirely consistent, therefore, that the severe types of hemoglobin deficiency, chlorosis and so-called idiopathic hypochromic anemia, occur almost exclusively in females.

The hemoglobin deficiency in chlorosis, which in its severe form was relatively common three or four decades ago, undoubtedly results from the additional strain of menstrual blood loss in girls in whom the iron reserve has been seriously lowered by recent rapid growth plus inadequacies in diet and absorption facilities. Most investigators and clinicians feel that mild cases of chlorosis are not altogether uncommon even at present and advocate the routine prophylactic administration of iron to adolescent girls.

The appearance of severe hemoglobin deficiency anemia in women nearing the end of their menstrual life produces a characteristic clinical picture. These patients, by virtue of anacidity or some other factors inhibiting absorption of iron from the gastro-intestinal tract, have been unable to maintain a positive iron balance against the inroads made by years of menstruation and, frequently, numerous pregnancies. This condition occurring in men invariably means chronic blood loss, and painstaking investigation must be resorted to until the bleeding source has been identified. Serious hidden pathology may be the answer to such investigations. After elimination of the bleeding source and adequate administration of inorganic iron, it has been common experience that further treatment may be discontinued without fear of recurrence.

Pregnancy is invariably associated with some decrease in hemoglobin level. This occurs in part as a result of the physiologic increase of blood volume during the latter part of pregnancy with hydremia accounting for ten or twenty per cent dilution of the blood solids. However, the developing fetus requires its blood building pabulum and takes its apportionment of iron from the mother. In the case of a normal full term fetus, born with an average hemoglobin complement of 120 per cent (regardless of the status of its mother's iron store), this would represent a loss to the maternal supply of approximately 500 milligrams of iron, or the equivalent of one liter of blood. Strauss and Castle,<sup>9,10,11</sup> from extensive observations on anemias of pregnancy, concluded that the essential causal factors were dietary deficiencies, mal-absorption from the gastro-intestinal tract usually in association with diminished gastric acidity during the third trimester, and the demands made by the growing fetus on the mother's iron supply. Thus we see the reason why iron becomes such an important adjuvant in

the dietary care and safeguarding of the pregnant woman.

From the standpoint of the infant, the iron reserve may be deficient if the maternal supply is low. This may be gathered from observations indicating that after the first year of life the hemoglobin level of an infant born of an anemic and untreated mother will usually fall to approximately 40 per cent. In contrast to this are the hemoglobin values of 80 per cent plus usually noted in one-year-old infants whose mothers' blood counts, if not normal during pregnancy, had been sufficiently bolstered by iron therapy during this period. Obviously, the hemoglobin values of prematurely born infants and of multiple pregnancy babies need special attention because of the probability of a subnormal iron endowment at birth.

Depletion of the iron store through growth occurs as the result of the sharp demand for new red blood cells to satisfy the rapidly enlarging and spreading blood volume. This becomes most apparent during the periods of greatest change in growth ratios, as during infancy and adolescence. During childhood, with enhanced dietary intake and a slowing of the growth ratio, anemia is not usually evidenced unless faulty iron absorption ensues due to circumstances as infections, gastric anacidity, or capriciousness of eating habits. Heath<sup>1,2</sup> has expressed as his opinion that iron should be administered routinely to all infants after the age of three months, to adolescent girls and to pregnant women.

Having considered these three sources of loss of bodily iron, and the depleting effect on the iron reserves, attention must be given to the mechanism of restitution. The faculty of absorbing and making available for use sufficient iron is influenced by numerous adverse circumstances, many of which have been referred to in the preceding discussion. The dietary intake must be adequate in all respects, in protein, in vitamins as well as in iron containing foodstuffs. Besides this there must be the will to eat and a properly attuned gastro-intestinal tract to insure normal absorption. This implies an availability in the digestive processes of hydrochloric acid and of bile and an absence of such deterrent factors as hepatic inadequacy, chronic diarrheal states, intestinal fistulae, hypothyroidism, and avitaminosis. Under favorable circumstances the rate of absorption of iron is controlled largely by the demand. In severe

depletion, Heath<sup>3,4,5</sup> has shown that injected iron can be recovered quantitatively as hemoglobin, thus indicating the avidity with which the body may take up iron if available.

Under normal circumstances the body is able to replenish a depleted iron store from dietary source alone but at a relatively slow rate. Approximately 25 milligrams of absorbed iron is required to synthesize enough hemoglobin to raise the level one per cent. When one considers that only about 5 milligrams daily are absorbed from an adequate food intake, simple calculation would indicate that some fifty days would elapse before a rise of ten per cent in hemoglobin level could be expected. When by common experience this absorption rate is accelerated ten or fifteen times by the addition of an excess of inorganic iron to the diet, the indication for gross iron therapy becomes obvious.

It is of greater concern in iron therapy that adequately large doses of inorganic iron be given than that any particular form or combination be used. The more soluble iron compounds have come into favor because the effective dose is smaller. The necessity of giving infants and children relatively larger dosage per kilo has been emphasized by Meulengracht,<sup>6</sup> who incidentally was one of the first to point out the fallacy, so prevalent in the first quarter of our century, of treating low hemoglobin anemia with small, supposedly stimulating doses of iron, frequently in the form of ineffective organic combinations. The technic of iron therapy in very weak infants and prematures seems to be beset with danger of serious gastro-intestinal irritation. Minot<sup>7</sup> points out the ineffectiveness of administering iron solutions in milk owing to the formation of insoluble phosphates which are not readily absorbed. The fallacy of using combinations of liver extract and iron in routine treatment of anemia has been previously pointed out. Although Hart and Steenbock have demonstrated that minute amounts of copper are essential in the utilization of iron, therapeutic attention to this combination is in all probability unnecessary because of the almost universal contamination of foods and commercial iron preparations by sufficiently large traces of this element. The parenteral use of iron should be mentioned merely to discourage it. Heath has stated that injected iron may be very toxic in doses approaching therapeutic value. The parenteral administration of



25 milligrams which, if entirely utilized, will elevate the hemoglobin level only about one per cent, may cause severe local reactions, as well as nausea and vomiting. If necessary to employ this method, a ten per cent solution of ferric ammonium citrate may be injected intramuscularly in doses not exceeding one cubic centimeter.

I have attempted to outline the fascinating, yet quite simple, principles dealing with bodily iron, its physiology and the mechanism of restoration therapy. The three great sources of iron loss to the body are found incidental to the growth factor in infancy and adolescence, to the apportionment of the mother's iron to the infant during pregnancy and lactation, and to the loss incidental to bleeding. Persistent consideration of these factors opens up for us the main indications for iron therapy. Appreciation of the principles underlying iron deficiency anemia is as stimulating to diagnostic acumen as it is to effectiveness of preventive and curative therapy.

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## TOXIC EFFECTS OF CARBON TETRACHLORIDE

### Report of Case

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CARBON TETRACHLORIDE is a chemical used in industry and also used for therapeutic purposes. Physically it is a colorless, transparent fluid, derived from methane, having the formula:  $\text{CCl}_4$ . It is similar to chloroform but is more toxic. It is volatile at ordinary room temperature and is about five times as heavy as air. Its volatility makes it accessible for inhalation and its density makes ventilation of buildings difficult. The chemical is readily absorbed through the lungs, integument and gastro-intestinal tract. There are numerous occupations in which the workers may be exposed to vapor from carbontetrachloride: in dry cleaning, shoe dye establishments, in the manufacture of certain paints, in the vulcanizing industry.<sup>12</sup> Numerous cases of toxic effects have been reported from the industries.<sup>4,11</sup>

Oral administration<sup>4</sup> of carbon tetrachloride has been used in hookworm therapy since 1921<sup>2,3</sup> and Lambert<sup>5</sup> reported in 1933 over 100,000 consecutive treatments without a death and with few un-

toward symptoms. However, toxic effects were reported by Lamson, Minot and Robbins<sup>6</sup> in alcoholics or in those who ingested alcohol soon after treatment. They also found that the taking of fatty foods hastened the appearance of toxic symptoms. It was also observed that animals on a diet low in calcium were more susceptible to carbon tetrachloride poisoning and that animals on diets to which calcium carbonate or calcium lactate had been added showed a tolerance to the drug.

The inhalation of fumes of carbon tetrachloride causes acute symptoms which are chiefly narcotic similar to the anesthetic effects of related drugs. However, the toxic effects to the liver and kidneys may become manifest at a later time, from twenty-four to thirty-six hours after exposure.<sup>7,9</sup> One hundred parts of carbon tetrachloride per million parts of air is generally considered the maximal, allowable concentration for any prolonged exposure.<sup>1</sup> Madding and Butt<sup>8</sup> have reported a case of hepatitis from inhalation of

fumes. Hans Smetana<sup>10</sup> has called attention to the renal symptoms of poisoning by this drug, which soon overshadow the symptoms of hepatic damage and presents a characteristic clinical picture which is so typical that one may be led to the correct diagnosis merely from observation of the symptoms and interpretation of the laboratory findings, even in the absence of the history of carbon tetrachloride poisoning. The laboratory findings indicate a severe hepatitis and an accompanying or subsequent kidney damage, which have been confirmed by autopsy material. The gross anatomical findings were central necrosis of the liver and microscopic studies showed marked renal nephrosis. Smetana has suggested that an analysis of the cases of carbon tetrachloride poisoning reported in the literature indicates a greater percentage of renal symptoms in those cases of poisoning due to inhalation.

A brief description of the clinical symptoms of the immediate and late effects of poisoning by carbon tetrachloride will be presented in outline form along with the usual laboratory findings considered of value in arriving at a diagnosis.

### Clinical Effects of Carbon Tetrachloride Poisoning

#### *Immediate effects:* (three to twenty minutes)

1. General: Headache, dizziness, general malaise, loss of consciousness (narcotic) or death by paralysis of vital centers.
2. Local: Irritation of oral, nasal and conjunctival mucous surfaces.

#### *Delayed effects:* (twelve to thirty-six hours)

1. General: Headache, muscle pains, general malaise.
2. Local: Inflammation of mucous membranes noted above.
3. Visceral: Nausea, vomiting, hematemesis, diarrhea.
4. Hepatic: Abdominal pain, tenderness in abdomen, jaundice (icteric index 12 to 30).

#### *Late effects:* (two to eight days)

1. General: Headache, vertigo, general malaise.
2. Local: Sub-conjunctival hemorrhages, hemorrhagic diathesis, inflammation of mucous membranes.
3. Visceral: Nausea, vomiting, diarrhea, colicky pains in abdomen, bloody stools or hematemesis.
4. Hepatic: Signs of hepatitis (liver enlarged and tender). Jaundice increases (icteric index 30 to 90).
5. Renal: Oliguria, anuria, generalized edema, uremic coma (suppression of renal function).
6. Central Nervous System: Epileptiform convulsions, increased blood pressure, increased muscle tonus, hiccough and stupor.
7. Other effects: Pulmonary edema (Variable).

### Laboratory Findings in Carbon Tetrachloride Poisoning

#### *Blood cytology:*

1. Red blood cells: Polycythemia early.  
Anemia later
2. White blood cells: leukocytosis up to 35,000 cu. mm.  
Later returns to normal.

#### *Blood chemistry:*

1. Non-protein nitrogen: increased to 200 mg.
2. Urea content: increased to 200 mg.
3. Creatinine content: increased to 12 mg.
4. Carbon dioxide combining power: lowered.

#### *Icteric Index:*

1. Early—12 to 30.
2. Late—30 to 90.

#### *Urine:*

1. Specific gravity: no significant change.
2. Sugar: negative.
3. Albumin: two to four plus.
4. Microscopic: Red blood cells, 10 to 200 per high power field.  
White blood cells: 20 to 100 per high power field.  
Casts: many with predominance of hyaline forms.

#### *Blood pressure:*

1. Early, very little change.
2. Late, readings of 200 to 300 mm. Hg. systolic and readings of 90 to 120 mm. Hg. diastolic.

### Case Report

A thirty-one-year-old white man, a salesman, was admitted to the hospital on December 6, 1938, because of general malaise, nausea, vomiting, diarrhea and numbness of the extremities. Three days previously he had used a "Pyrene" fire extinguisher to put out a small fire in the upholstering of his automobile and had inhaled considerable smoke and fumes with no immediate deleterious effects except a burning sensation in the nose, throat and of the conjunctivæ. These latter symptoms had persisted to the time of his admission to the hospital.

*Present Illness.*—Immediately after exposure to the fumes of the smoke and fomite from the fire extinguisher, to which he was exposed for about one-half hour, he took one or two alcoholic drinks and states that he felt well that night. On awakening the following morning he had some general malaise and later developed a severe headache. He then noted some abdominal discomfort and became nauseated and vomited several times. That evening he noted a looseness of the bowels with several watery stools. He slept poorly that night and on the second day had persistence of the malaise, nausea, vomiting, diarrhea and headache. He then noted that the conjunctivæ were injected and sore and that he had some numbness of the extremities. He was coughing and expectorating a greyish sputum. On this day he took some "Alka-Seltzer" and some Peppermint Water (2 per cent) and states that he did not

retain these nor any food or liquids taken during that day. He further stated that his urine was cloudy but seemed to be normal in amount. He consulted his physician on December 5 and was sent to the hospital the following day, which was the fourth day after exposure and the third days of his illness.

**Physical Examination.**—The patient, well nourished and well developed, appears to be acutely ill, but is intelligent and coöperative. The conjunctivæ are injected and an ecchymosis is present in both sclera and conjunctiva. The skin has a bronzed color and is dry. The temperature was 98.6 F., the pulse rate 90 and the respiratory rate 20. The blood pressure was 120 mm. Hg. systolic and 70 mm. Hg. diastolic. Pupils responded to light and accommodation. Oral mucous membranes were dark and deeply cyanotic. There was no dullness over the lung fields and breath sounds over the chest were normal. The heart tones were of good quality and no murmurs or arrhythmia were noted. The abdomen was slightly distended and was tympanitic to percussion. The liver margin was down about 4 cm. below the costal margin and was tender to deep palpation. The extremities showed a slight edema. All the reflexes were found to be hyperactive. The Babinski was negative. Knee jerks were four plus.

**Laboratory Findings.**—Examination of the blood showed: hemoglobin 83 per cent (Sahli); red blood cells 4,110,000 cu. mm.; white blood cells 10,000 per cu. mm.; differential count, polymorphonuclears 87 per cent, lymphocytes 10 per cent, eosinophiles 2 per cent, basophiles 1 per cent. A subsequent white blood count on December 13 showed 13,800 cells per cu. mm. with 94 per cent polymorphonuclears. On this same date the hemoglobin was 75 per cent and the red blood cells were 3,780,000 cells per cu. mm. On the day of admission no urine could be obtained and on the specimen obtained the following day the quantity was not sufficient to determine the specific gravity. This specimen showed a 1 plus reaction for albumin and was negative for sugar; microscopic examination showed 30 to 40 pus cells per high powered field; urobilinogen was negative, bilirubin was negative and urobilin a trace. Later urine specimens on subsequent days showed a 1 to 2 plus albumin, sugar negative to a trace, pus cells 20 to 80 per high powered field and 10 to 40 red blood cells per high powered field; also the presence of occasional granular casts was noted. The blood serum at the time of admission showed: urea nitrogen 47.5 mg. per hundred cubic centimeters; icteric index 22. Later readings showed an increase in these values which are given below.

**Course.**—There was an almost complete shutdown of the function of the kidneys for a period lasting several days in spite of a satisfactory intake of fluids including daily intravenous administration of 5 per cent glucose in normal saline solution. The urinary output was zero the first twenty-four hours with succeeding measured outputs per twenty-four hours of 100 c.c., 180 c.c., 145 c.c., 150 c.c., 20 c.c., 765 c.c., 650 c.c.,

775 c.c., 1,750 c.c., and 2,125 c.c. from the period December 8 to 17, inclusive. During this period the albuminuria and pyuria persisted and there was hematuria on several occasions. It was during this period that the nitrogenous waste products accumulated, as evidenced by chemical studies on the serum: non-protein nitrogen readings of 99.04 mg., 77.85 mg. and 97.17 mg. on December 11, 12 and 13, respectively; creatinine value of 3.77 mg. on December 12. Sputum typing on December 13 showed no reaction with Neufeld serums. However, chest radiograph on December 12 showed evidence of pulmonary edema. Short wave diathermy was instituted on December 12 over both lumbar areas and was continued for two days. From December 13 to 26 the output of urine increased, reaching a normal value on about December 18 or 19 and this was accompanied by marked clinical improvement. The jaundice receded, the urine became negative for albumin and there was a reduction in the number of white blood cells, red blood cells and casts in the urine specimens. The blood pressure had been elevated during the period of oliguria to 180 mm. Hg. systolic and 110 mm. Hg. diastolic, but returned to normal readings as the urinary excretion became nearer to normal in amount. Chest radiograph on December 15 showed regression of the signs of pulmonary congestion (edema). During the period of oliguria (December 6 to 16) the patient suffered from hiccough, mild convulsive seizures, restlessness, insomnia and numbness of the face, hands and extremities. During this same period he had repeated emesis and did not retain food or liquids. He received daily intravenous injections of glucose (5 to 10 per cent) in normal saline and on December 13 and 14 he was given intravenous injections of 50 per cent dextrose, 50 and 65 c.c., respectively. He received parenteral fluids until December 18, at which time he was able to eat and retain food and liquids.

The patient was ambulatory at the time of his discharge from the hospital on December 28, 1938, and has returned to his former occupation. Subsequent blood examinations have revealed no evidence of damage to the hematopoietic system.

The final clinical diagnosis was acute poisoning due to inhalation of fumes of carbon tetrachloride. On the basis of clinical symptoms and laboratory findings the clinico-pathological diagnosis was: Toxic hepatitis and acute nephrosis, secondary to poisoning by carbon tetrachloride.

### Comment

1. This case report illustrates the delayed effects of inhalation of fumes of carbon tetrachloride.
2. Special attention is invited to the effects on the central nervous system, which were evidenced by hiccough, mild convulsive seizures, increased muscle tonus, hyperactive reflexes and numbness of the face and extremities.
3. Another effect observed was the prolonged bleeding time and the hemorrhagic diathesis as

manifested by the ecchymoses and bleeding into the sclera and conjunctival membranes.

4. The use of physiotherapy in the form of short wave diathermy over the kidney regions was thought to have favorably influenced the return of normal kidney function.

Report of a case of carbon tetrachloride poisoning from inhalation of fumes of a fire extinguisher is made from the personal observation of the authors.

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### ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The following were among the subjects considered at the annual meeting of the Council on Pharmacy and Chemistry:

The Council voted that a special committee be appointed to consider in extenso the digitalis unit and report back to the Council. It was emphasized that digitalis, or anything that purports to be digitalis, is an official drug and must be standardized according to the methods laid down by the U. S. Pharmacopeia; that if there is a demand for another standard, that standard may appear on the label in addition to the U.S.P. standard, provided the labeling of the second standard is not misleading.

The Councils' Committee on Contraceptives made a progress report concerning certain articles that have been authorized for publication.

The Council voted to adopt the pharmacopeial term "thiamine hydrochloride" to replace the term suggested by the discoverer, i.e. "thiamin chloride."

The Council authorized the Secretary's office to approach certain persons with the request that they contribute to the new series of articles on glandular physiology and therapy.

The Council discussed the present status of pneumonia therapy. It was the general consensus that there is not sufficient information yet available to determine the value of combined serum and sulfapyridine compared with adequate serum therapy alone or with adequate sulfapyridine therapy alone. The Council members felt that the practice of typing should be continued for information, both in relation to treatment and for statistical purposes. The Council also voted to accept type III rabbit antipneumococcal serum for a period of one year only. Furthermore, the Council will consider with the view to acceptance the carbohydrate material for skin testing and treatment in conjunction with antipneumococcal serums (Francis test).

The Council concluded that a statement should be prepared announcing recognition of solution of zinc insulin crystals for inclusion in New and Nonofficial Remedies. The referee was authorized to formulate a report regarding the problems relating to antiseptics, bacteriostatic agents, preservatives and disinfectants, for the consideration of the Council and, if possible, to consult with the federal authorities concerned with these questions. A progress report was made concerning the further investigation of catgut sutures.

The Council discussed the question of the increasing number of large size brochures dealing with proprietary drugs. In this form of advertising the commercial houses take on themselves the task of educating the physician in the fields to which their products pertain. It was voted that a special committee be appointed to inquire into the matter of advertising brochures and report to the Council, especially in regard to the abuses.

The Council voted to revise and rearrange the New and Nonofficial Remedies chapter on serums and vaccines. The Council authorized a review to be made of the lipoid pneumonia problem, on the basis of which the Council might again consider what action to take in the case of nasal sprays in which liquid petrolatum is the vehicle.

The Council ordered that revisions be made in the permissible claims for riboflavin, nicotinic acid and pyridoxine (vitamin B<sub>6</sub>), these alterations to be passed on by the Coöperative Committee on Vitamins with the view of later publishing a revised edition of the pamphlet entitled "The Status of Certain Questions Concerning Vitamins," and concordant revision of the statements in New and Nonofficial Remedies. The Council voted to accept the terms "pyridoxine" and "pyridoxine hydrochloride" for the substances known as vitamin B<sub>6</sub> and vitamin B<sub>6</sub> hydrochloride, provided the nomenclature met with the approval of the American Society of Biological Chemists and the American Institute of Nutrition (an official announcement of the Council on these names was published in *The Journal*, June 15, 1940, p. 2387).

The Council also discussed the term "halibut liver oil with viosterol" for a product containing halibut liver oil with viosterol and other fish liver oils. The addition of cod and other fish liver oils to a product sold under the labeled name "halibut liver oil with viosterol" will make the product subject to action under the misbranding provisions of the Federal Food, Drugs and Cosmetic Act even though the presence of the added ingredients is declared elsewhere on the label. The Council therefore voted that the present New and Nonofficial Remedies' definition for halibut liver oil with viosterol be revised to read: Halibut liver oil-N.N.R. to which has been added sufficient viosterol (activated ergosterol) to assure a potency of not less than 10,000 U.S.P. units of vitamin D per gram. (*Jour. A.M.A.*, July 139, 1940, p. 132.)



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## HISTORY OF MEDICINE IN MINNESOTA

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### HISTORY OF WINONA COUNTY

*(Concluded from September issue)*

#### Biographies

**Francis J. Tourtellotte** was born on December 26, 1835, in Windham County, Connecticut. He graduated from the normal school at Bridgewater, Massachusetts, then began the reading of medicine under Dr. John McGregor, of Thompson, Connecticut. He later graduated from the College of Physicians and Surgeons of New York. In 1863 he entered the medical service of the U. S. Navy, where he served as surgeon until 1868. Coming to Winona in 1869, he engaged in the business of loaning money. Dr. Keyes of Winona said of him (September, 1930) that he never practiced, but was a capitalist. Dr. Tourtellotte and his wife did much traveling during their residence in Winona.

**George Townsend** was listed as a Winona County physician in 1865.

**J. H. Travis** was a Winona County doctor about 1864.

**Oscar Trenkler, M.D.**, came to Winona to practice in July, 1861, and at that time published the following notice:

O. TRENKLER AND CO.  
*German Homeopathic*  
*Physicians and Surgeons*  
Office—over Orrin Smith & Co.'s Bank  
Dr. O. Trenkler      Dr. A. Putsch

This partnership dissolved before Dr. Trenkler's service in the Civil War. He returned to Winona and again started the practice of his profession in August, 1866.

**T. S. Troyer** was a Minnesota City doctor who came to practice there in 1881 or 1882.

**J. Q. A. Vale** came to Minnesota as early as 1857. In 1868 he was practicing at Homer. In that year he was a member of the lower house of the State Legislature, representing the 11th district. He served as town clerk of Homer in 1869 and again in 1876. Dr. Vale was a very active Republican, and in 1875 was chairman of the Republican county convention in Winona. He had served on a committee for the permanent organization of the Republican county convention in October, 1869. In that year the Winona County Medical Society was organized and Dr. Vale was one of the charter members. He was elected to membership in the Minnesota State Medical Society in 1870. In 1876 he moved to Winona in order that his children might have the advantage of the excellent schools of that city.

## HISTORY OF MEDICINE IN MINNESOTA

Aside from the practice of his profession and his political interests, Dr. Vale had an interest in a sugar mill in Homer, and owned the mill in 1881. At that time he may have returned to live at Homer.

**L. Viall** was a Winona doctor in 1857.

**Peter Von Lackum** was a botanic physician and surgeon in Winona in 1872 and remained four years or more.

**H. S. Wahl**, physician, settled in Minnesota City in 1884. In the same year he had graduated from the Chicago Medical College. Later he became a member of the Winona County Medical Society. Before his coming to Winona County he had been a resident of London, Canada. He became involved in domestic difficulties and left Winona under a cloud.

**J. B. Walton** was a physician at Homer about 1873 to 1880.

**H. S. Walrath, M.D.**, came to Winona County from New York in 1869 and settled at Stockton as a partner of Dr. S. B. Sheardown. Dr. Sheardown was to be absent for a time and he recommended his new partner to his friends and patrons. In August of that year, Dr. Walrath married Miss Belle M. Collins, also of Stockton, who later took up the practice of medicine. In 1876 or before, he moved to Minnesota City and practiced there until September, 1882. At that time he sold his residence and office to Dr. Newberry and moved to Saint Paul. Both Dr. Walrath and his wife practiced in Saint Paul. In 1885 he was elected to membership in the State Medical Society.

**Belle M. Walrath, M.D.**, the wife of Dr. H. S. Walrath, graduated from the Woman's Medical College in Chicago in 1882, after a two-year course. In April, 1882, her husband was accidentally poisoned, but was saved by her prompt administration of antidotes. She may have practiced in Minnesota City for a few months before their moving to Saint Paul in September, 1882. In 1883 she became a member of the Minnesota State Medical Society. At that time she was practicing medicine in Saint Paul.

**H. D. L. Webster** came to Winona about 1860 or 1862. His card read as follows:

### Homeopathy

DR. H. D. L. WEBSTER

having added largely to his stock of medicines, will, in addition to his professional duties, furnish country practitioners and families with Homeopathic Tinctures, Triturations, and medicated pellets by the case or single bottle, in any attenuation desired. Particular attention paid to chronic Diseases, such as Dyspepsia, Scrofula, Female Complaints and Consumption.

Office—with Dr. Welch, over People's Store, Hubbard's block

Residence—In the yellow house on Third st. near J. H. Jacoby's.

Dr. Webster left Winona but returned in May, 1867, and again engaged in the practice of medicine.

**Baker Webster** was a doctor in Winona County in 1857.

**Henry R. Wedel, M.D.**, graduated with distinction from the medical department of the University of Pennsylvania in the spring of 1862. He came to Winona early in that year and opened an office for the practice of medicine and surgery over Wienand and Company's drug store. He had been an assistant druggist with Wienand in 1857.

In September, 1862, he received the appointment of first assistant surgeon in the Fourth Minnesota Regiment, taking that commission in preference to an appointment of surgeon in one of the new regiments. During his term of service he became surgeon of the Fourth Regiment. He returned from service in June, 1865, and again took up the practice of his profession. Later in the same year he married Miss Anna Hibert of Winona.

In July, 1866, he associated himself with Mr. William Netter in the drug and medicine business, relinquishing his practice.

In March, 1878, he again took up the practice of medicine and surgery. During that year he became a member of the Minnesota State Medical Society, and about the same time was elected to membership in the Winona County Medical Society. He held the office of president of the latter organization in 1879. He sold his drug store in 1881, wishing to give his attention exclusively to medical practice. During his stay in Winona, he was at one time examining physician of the Saint Joseph's Benevolent Society, which was probably in connection with Saint Joseph Hospital referred to by Curtiss Wedge in his "History of Winona County" as the first adequately equipped hospital in Winona.

Dr. Wedel was an active Democrat during the seventies. He was a charter member of the Winona Council of the Order of the Royal Arcanum.

In 1883 Dr. Wedel decided to locate in Saint Paul, where he practiced for some time. He was very well liked by the Winona people, and occasionally returned for a visit.

**Alfred Welch**, physician, surgeon, and druggist, settled in Winona in 1856. In that year he advertised a wholesale and retail drug and prescription store. He had been for a long time connected with a large house in Philadelphia, in the sale, compounding, and dispensing of drugs and medicines. He pledged himself to sell drugs as low as they could be bought in Chicago or Cincinnati, and also advertised correct and prompt service.

Dr. Welch lived in Winona as a physician and druggist thirty years or more.

**Frederick Welch** was a Winona doctor in 1867. He died in New Jersey in 1883.

**George Welch** was a Winona physician during the seventies. He left Winona in 1878.

**Charles E. Wentworth** was a Winona County physician in 1864.

**William A. Whippy, M.D.**, came to Winona in 1866 from New York State "bearing high recommendations as a practitioner." He was the partner of Dr. Pierce, and their card, published in 1866, read as follows:

## HISTORY OF MEDICINE IN MINNESOTA

DRS. PIERCE—WHIPPY  
Homeopathic physicians                      surgeons  
Office in Hubbard's Block—2nd Street  
Winona, Minn.

Dr. Whippy married in 1868, and lived in Winona for a time. In 1883 he and his wife and child were residents of Goshen, Indiana.

**Lawrence G. Wilbertson, M.D.**, was born in Hornellsville, New York, on April 18, 1852. After completing his preparatory studies, he entered Cornell University, where he studied for some time. Then he taught school a year in the Lima Seminary, at Lima, New York. Early in life he had determined to be a physician, so he began reading medicine at the office of Dr. T. C. White at Rochester, New York. In 1880 he graduated from the Hahnemann College at Philadelphia, and at once came to Winona. Not long after his arrival he became a member of the Winona Academy of Homeopathy. Later he was elected to membership in the Minnesota State Homeopathic Association, and also the American Institute of Homeopathy. He supplemented his medical education by extensive reading and by study abroad in 1901-1903. He practiced in Winona for more than fifty years.

**B. A. Wilder** was a Winona County physician in 1864.

**Adelaide Williams** was a homeopathic physician in Saint Charles about 1870, or earlier. She remained there for ten years or more. In 1877, Dr. Williams was elected to membership in the State Homeopathic Institute.

**J. E. Wright** was a physician and surgeon in Saint Charles in 1869 or 1870.

**William J. Youmans** graduated from the medical department of the University of New York, taking special instruction under Professor Draper, and soon afterward went to England to pursue physiological studies in the laboratory of Professor Huxley. While there, in connection with Professor Huxley, they jointly published "The Elements of Physiology and Hygiene," the section on hygiene being Professor Youmans' work. This work was simultaneously published in England and in the United States. Returning to America, Dr. Youmans came to Winona (1869), and for about two years engaged in the practice of medicine and surgery. On the establishment of the *Popular Science Monthly* he was called to New York to assume the post of assistant editor. In June, 1871, he was the scientific editor of the *Galaxy*. He was editor of the *Scientific Monthly* for many years.

**Arthur B. Young, M.D.**, came to Winona in July, 1876, from Minneapolis. He purchased the residence of Dr. A. B. Stuart and took up his residence in Winona as the partner of Dr. J. B. McGaughey. In the year of his arrival, Dr. Young became a member of the Winona County Medical Society. In 1875-1876 he taught in the Winona Preparatory Medical School. The date of his departure from Winona is unavailable, but in March, 1884, he was a resident of Prescott, Wisconsin.



## HISTORY OF MEDICINE IN MINNESOTA

### THE MISSIONARY AS PRACTITIONER: DR. THOMAS SMITH WILLIAMSON

By ARTHUR S. HAMILTON, M.D.

MAJOR Purcell was succeeded as physician at Fort Snelling by Dr. B. F. Harney, who had as his assistant Dr. Robert C. Wood. The latter became Surgeon in 1829. During the Civil War he was appointed Assistant Surgeon General. Among the names of other medical men stationed at Fort Snelling, the following may be noted: Nathan S. Jarvis, who entered the army in 1813 from New York and died in 1862; Dr. Fitch, 1837; George F. Turner, 1843, who entered the army from Virginia in 1825 and died in 1854; Joel Martin; Adam N. McLaren, who entered the army in 1833, became post surgeon in 1849 and died in 1874; and John Emerson. These men were not particularly noted physicians. Emerson derives his chief claim to be remembered from his ownership of the Negro Dred Scott. Dr. Turner's name is of interest because of his report on an epidemic of scarlet fever at the fort, which was the first contribution to a medical periodical to be written by a Minnesota physician. As has been suggested, the first responsibility of the post surgeons was the health of the soldiers stationed at Fort Snelling. They also offered remedies and surgical services to Indians living around the fort. However, as the line of settlement, moving steadily westward, caught up with the army, and the civil population around the fort became increasingly numerous, the services of the military physicians assumed a wider significance. Not infrequently they were called on errands of mercy outside the limits of the reservation, and ministered to the needs of the residents of Saint Paul's. In this they were aided, or rather their efforts were supplemented during the decade of the forties by the work of Dr. Christopher Carli and Dr. Thomas Smith Williamson. Dr. Carli lived at Stillwater, and was the first resident physician to build up a regular practice in Minnesota. His work will be noted in further detail in another place. Dr. Williamson represents the missionary as practitioner.

Born in the year 1800 in South Carolina, Williamson lived there for only a few years; his family moved to Ohio when he was four years of age. He first chose the medical profession for his life work and after his graduation from Jefferson College in Cannonsburg, Pennsylvania, read medicine with his brother-in-law, attended a course of lectures at Cincinnati, and studied at the medical school at Yale University, completing his course there in 1824. There followed eight years of general practice at Ripley, Ohio. During that period he became interested in missionary work among the Indians of the Northwest, but hesitated to go out to the field because of the hardships that his wife and three young children would be required to endure. While the question remained still undecided in his mind, "the three little ones were gathered into the arms of their Savior." Accepting this as the will of God, Dr. Williamson at once gave up his practice, and entered Lane Theological Seminary in Cincinnati. In April, 1834, he was licensed to preach and, in the summer of the same year, he visited the Indians of the Upper Mississippi, going as far as Fort Snelling. The following year, in May, 1835, the Reverend Thomas Smith Williamson, M.D., a regular appointee of the American Board, arrived at Fort Snelling with a missionary band of five adults and three children—his wife and child, his wife's sister, Miss Sarah Poage, and Mr. and Mrs. Huggins with their two children. Mr. Huggins came to teach the Indians improved methods of agriculture.

From the time of his arrival in 1835 until his death in 1879, Dr. Williamson devoted himself unsparingly to the needs of others. For several years the scene of his labors was the mission that he established near Joseph Renville's trading

station at Lac qui Parle. During this period his chief concern was the Christianizing of the Sioux Indians. His efforts toward that end were largely evangelical and educational. Within two years he had mastered the Dakota language sufficiently to preach to the Indians in their own dialect. Soon he was engaged in the writing of hymns, the compilation of a dictionary, and the translation of the scriptures into the Dakota language. In the latter task he was assisted by Joseph Renville and Gideon Pond. In November, 1846, he moved with his family to Little Crow's village, seven miles below Saint Paul, where for six years he ministered to the needs of his white neighbors as well as of the Indians. After the Treaty of Traverse des Sioux in 1851 he followed the Indians to their new reservation at Yellow Medicine in the western part of the present state. There he continued to work until the Indian massacre of 1862. In later years he served as a member of the Board of Visitors to the Chippewa Indians in the vicinity of Cass, Leech and Winnibigoshish lakes. The years preceding his death were spent in St. Peter.

Although he was primarily interested in spreading the gospel, the medical work that Dr. Williamson did among the Indians assures him of his place in the present volume. He carried on an active practice, and established a medical mission years before such units were recognized by missionary boards. Possibly this activity had much to do with the wave of unpopularity which manifested itself eight or nine years after his coming to the post at Lac qui Parle.<sup>†</sup> The Indians did not want the white man's religion and were frankly suspicious of his motives for coming amongst them, but they were not, at first, aggressively opposed to the missionaries, and it was possible, by means of a feast, for example, to bring together a fair congregation, even of men. As time went on, however, the Indian medicine men began to see that the white men's medicine was superior to theirs and that their power would necessarily decline. Then began an organized opposition to the white man. A failure in crops and other misfortunes were charged to the missionaries. Then the mission oxen began to disappear, then the horses, and finally the family cow was all that was left to haul the firewood. The Indians were directed to remain away from the church, school, and mission house, and those who disobeyed the injunction were subjected to various petty persecutions. These were the conditions that induced Dr. Williamson to remove to Kaposia.

While living at Kaposia, the missionary doctor assumed the duties of Dr. Turner at the fort during the latter's absence from the garrison. An account book has been preserved which carries the following items of interest, dated 1843:

"For attending on the Garrison and Indians for Dr. Turner, three months and eight days, \$229.00. For private practice while living near Fort Snelling, \$110.06."

The items do not show whether he was paid by Dr. Turner or by the government. The six cents must have come in some way through the price charged for drugs. In his private practice he was moderate in his charges, and seldom received money in payment. Usually he received his compensation in beef, potatoes, and grain.

Dr. Williamson's long period of service among the Sioux Indians enabled him to study their diseases, and their medical practices much more closely than was ordinarily possible for a white man. He improved his opportunities, and in later years wrote several papers which have their place in the literature of Minnesota

<sup>†</sup>"A Brother to the Sioux," by Winifred W. Barton, p. 22.

medicine. Two of these articles have been selected to be reprinted in the present volume. The first, entitled "Diseases of the Dakota Indians," first appeared in the *Northwestern Medical and Surgical Journal*, 4:411, 1873-74. The second, on "Dakota Medicine," is reproduced from Stephen R. Riggs, *Tah-Koo Wah-Kan; or, The Gospel Among the Dakotas*, 1869, page 435.

## DISEASES OF THE DAKOTA INDIANS\*

By THOMAS S. WILLIAMSON, M.D.

MY acquaintance with the Indians of Minnesota dates from the time of my arrival with my family at Fort Snelling, May 16, 1835. After residing there a little more than a month, I proceeded to Lac qui Parle, where I arrived on the 9th of July; and made my home there from that time until November, 1846; though in that time I was absent two winters, and most years at least one month in summer, getting supplies for my family.

There were about 400 Indians estimated as residing there at the time of my arrival, though a large portion, considerably more than half, were absent a month or two every fall and spring, and sometimes most of the winter; but in the winter the places of the absentees were more than filled by the aged, diseased and infirm from other villages, who were brought and left there by their relatives, who could not carry them along in their wanderings in search of food or furs in winter; and trusted to the hospitality of the residents to keep them from starving in their absence.

I had practiced medicine ten years in Southern Ohio, Adams and Brown Counties, had become familiar with the malarious paludal diseases, at that time very prevalent in those localities, and I here used my knowledge of medicine as a means of getting a hearing for that which I came to teach.

Though the medicine men bitterly opposed me because I refused to give medicine to those over whom they performed their incantations, and by my success deprived them of half their fees, I was called to see nearly every fatal case of disease which occurred among the Indians residing there; many also came, or were brought to me from other villages to get medicine, and for the last ten years of my residence there I heard of nearly all the deaths occurring in a population of about 1,000. It was not possible, however, to get such statistics as you ask for. The Government at one time asked for a census of the population there, and the traders and myself attempted to take it, but as soon as this was known by the principal men they positively forbade our completing it, and any attempt to proceed would have endangered our lives, for the reason that *their* lives would be endangered, they thought, by any such step.

About the time of leaving I remember having made an estimate that fully one-half of the deaths among the Indians with whom I was acquainted while there were violent deaths. Eleven were killed at one time by the Chippewas, and almost every year one or two were killed; there was, I suppose an average of one or two murders a year from drunkenness, jealousy, envy, et cetera, and also one or two suicides during the time.

Of those over ten years old who died of disease, I think fully half died of con-

\*Published in *Northwestern Medical and Surgical Journal*, Vol. iv, July, 1873-June, 1874, inclusive, p. 411.

sumption (phthisis pulmonalis), nor does this seem strange to me as from your letter it appears to you; for I do not think it was much more prevalent among the Indians than among our white population; while from the fact that they were all tainted with scrofula, their mode of life, et cetera, it might be expected that it would be very much more so.

Notwithstanding the many deaths from violence while I was at Lac qui Parle the number of births very much exceeded the number of deaths. The great proportion of phthisis was chiefly owing to so few dying of other diseases. I had lived among the Indians above twenty years before I ever saw one of them suffering from typhus or typhoid fever. Smallpox was in the country several times and was very fatal among the Indians on the Missouri and at Winona, but only one death occurred from it among the Indians at Lac qui Parle; and perhaps not more than a dozen among all the Indians on the Minnesota River, as they were generally protected by vaccination.

The measles, in an aggravated form, prevailed among the Indians once while I was there, and a number of them, several far advanced in years, died from it and the dysentery, which generally accompanies or follows it among Indians.

The above are all the cases of death from what are called zymotic diseases. I do not remember of ever having seen a well marked case of scarlatina among the Indians. There were some severe cases of sore throat, but none fatal of which I remember to have seen or known. From their phlegmatic temperament they are less subject to nervous diseases than whites, yet I have seen a number of severe cases of spasms among them, none of which, however, proved fatal, if I remember correctly. I recall one case of cancer, and only one. It was on the top of the foot, and fatal after four or five years. Several killed themselves by overeating, but I was not called to see them. As at that time they used little or no salt with their food, which was for the most part poor in quality, and often scant in quantity, plethora and the many inflammations which originate therefrom were unknown among them.

I remember of one old conjurer who died of pneumonia, brought on by exposing himself naked for hours out of doors to a chilly wind in October when it was alternately spitting snow and drizzling rain, performing religious rites to secure the assistance of their gods in favor of a war party against the Ojibways.

There were some several cases of suffering from disorders of the urinary organs, but none that came to my knowledge at Lac qui Parle proved fatal. Children often suffered severely from teething and owing to lack of suitable food. In such cases, some of them died from diarrhea or dysentery, and others from hydrocephalus; but not a greater proportion than among our white population. But among the women and children who remained in the neighborhood during the winter, scrofula was almost universal; caused by their subsisting entirely on corn, for weeks, and some years for months. Enormous swellings formed about their necks and armpits, and occasionally on other parts of the body, forming abscesses which sometimes so exhausted the system as to prove directly fatal, but more frequently by inducing phthisis or mesenteric diarrhea. In the spring when the ducks returned so that they could get animal food most of them got better and some entirely recovered.

*(To be continued in November issue)*



# President's Letter

## MEDICAL TESTIMONY

FOR a long time both our Medical Association and the Bar Association have felt that changes in court procedure in cases requiring expert medical testimony were needed. One of the chief reasons cited being the frequency in which medical testimony is biased in favor of the side employing the medical witness; this happens so often that it is hard for the Court to obtain impartial information. Another criticism is that of perjured testimony by the physician; this in turn at least implies a dishonest attorney. Another objection is testimony that is garbled and inconclusive, given by physicians who are not qualified by experience or training to act as experts.

Expert medical testimony should be intelligent, scientific, and dependable. Any physician chosen as an expert witness should by special training and broad experience be qualified to give reliable authoritative information. We realize that consultants often differ and the best of men may have honest differences of opinion; but too often these experts give opinions and draw conclusions so diametrically opposed and so conflicting that bias and partisanship are self-evident, and the expert testimony thus becomes worthless to the Court and jury.

Both the State Bar Association and the State Medical Association are agreed that improvements in court procedures involving medical testimony can and should be made. A number of changes have been suggested, some of which sound plausible. It would seem sensible that the testimony of the attending physician should be limited to the condition of his patient, the progress of the case, and the results obtained; he should have a definite idea as to the amount of recovery made, and be able to justify his opinion. But he should not be called upon as an expert witness. Various plans have been suggested for choosing expert medical witnesses: One plan is for the plaintiff and defendant each to choose a physician, and the court to choose a third to act as referee. Another suggestion is to have the County Medical Society choose the expert medical witnesses. Legislation will be required to make any such changes, however, and this will be difficult, requiring a long period of time.

In an endeavor to start some improvements in medical testimony, a new committee of our State Medical Society has been formed. Recently, and without our knowledge, the Minnesota State Bar Association also appointed a committee to work on the same problem. On July 11, 1940, during the annual meeting of the State Bar Association, we had the privilege of meeting with that committee. Among those present was Justice Royal A. Stone of the Supreme Court of Minnesota. Justice Stone is chairman of the Judicial Council created by the Minnesota Legislature in 1937, to make a "continuous study of the organization, rules and methods of procedure and practice of the judicial system of the state, and of all matters relating to the administration of said system and its several departments." Justice Stone told us it was his firm belief that when the various courts of the State are informed of the creation of our committee, we shall receive the enthusiastic support and cooperation of the courts in dealing with flagrant violators in the medical profession in matters concerning medical testimony. Reprimanding a few physicians should be an effective deterrent to such practices; more serious cases, and those involving perjury can be referred to the Minnesota State Board of Medical Examiners for action leading to suspension, or revocation of the license of the physician involved. This may seem like drastic action, but we cannot afford to allow the dishonesty of a few to continue to bring reproach on our profession. Our code of ethics not only does not condone such practices, but it is strongly opposed to them, and the courts of justice certainly cannot, and will not, uphold such violations of trust and honesty. This kind of misconduct must be stopped and it is the duty of every self-respecting physician to see that it is stopped.

B. S. ADAMS, M.D., President  
Minnesota State Medical Association.

## EDITORIAL

### MINNESOTA MEDICINE

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#### BUSINESS MANAGER

J. R. BRUCE

Volume 23      OCTOBER 1940      Number 10

### NEW PLAN ADOPTED TO CONTROL MEDICAL TESTIMONY

A new plan for control of dishonest medical  
testimony, source of scandal for many  
years, both to the medical profession and the  
public, was officially adopted by the Council  
of the Minnesota State Medical Association  
at its regular fall meeting held Sunday, Sep-  
tember 22, at the St. Paul Hotel.

This plan is the result of several confer-  
ences between a special committee appointed  
to study the question by President B. S. Ad-  
ams of Hibbing and representatives of the  
Minnesota State Bar Association, who have  
also interested themselves in the problem.  
The conferees had the benefit, also, of advice  
from Justice Royal A. Stone of the Supreme

Court of Minnesota, who is himself Chairman  
of a Judicial Council appointed by the Min-  
nesota State Legislature in 1937 to study  
rules and regulations and procedures of the  
judicial system of the state.

No change in legislation is contemplated in  
the plan submitted by Chairman E. M. Ham-  
mes of St. Paul and approved by the Council.  
Instead, a permanent Committee on Medi-  
cal Testimony of the Minnesota State Med-  
ical Association will be formed. Services of  
this Committee will be put at the disposal of  
any judge in the state who has reason to be-  
lieve that medical testimony in any case de-  
cided in his court has deliberately deviated  
from the truth.

Judges will be invited to submit such cases  
to the Committee for investigation and study.  
If, upon close investigation, it appears to the  
Committee that the testimony of the physi-  
cian was indeed dishonest, the case will be  
turned over, together with all findings, to the  
State Board of Medical Examiners for disci-  
plinary action.

Offenders who are thus reported to the  
State Board will be subject to censure and  
warning or to suspension or revocation of  
their license to practice medicine, according to  
the judgment of the Board.

The seriousness of the problem of dishonest  
expert testimony has been recognized by rep-  
resentatives of organized medicine for many  
years. Many proposals have emanated both  
from physicians and lawyers for changes in  
the law which would eliminate entirely the  
hiring by litigants of medical experts. Legal  
authorities who conferred with the Commit-  
tee on the new plan of attack did not, how-  
ever, favor any movement to change the law  
at the present time. All of them felt that  
the existence of the new Committee would,  
if its functions and objectives were well  
known, achieve a great deal to control the  
situation in Minnesota.

The importance of the new Committee and  
its work was therefore emphasized by the  
Council and instructions were issued to inform

every judge on the Minnesota bench of its existence and its availability for investigation of suspicious cases.

"Honest differences of opinion exist, of course," Dr. Hammes pointed out in his report. "Every allowance should be made for such differences wherever the point at issue admits of honest disagreement on the part of medical witnesses called.

"The plan is not designed to eliminate differences of opinion but to control the occasional 'shyster' physician who, like the 'shyster' lawyer, makes a farce out of justice and casts discredit upon his entire profession.

President Adams immediately appointed the members of the temporary committee who studied the question with the Bar Association, to the permanent committee. They are:

Dr. E. M. Hammes, St. Paul, *Chairman*  
 Dr. H. B. Annis, Minneapolis  
 Dr. L. A. Barney, Duluth  
 Dr. J. F. Norman, Crookston  
 Dr. W. G. Workman, Tracy.

A similar committee is being appointed by the Minnesota State Bar Association and plans are already under way for an early meeting of the two committees.

In the meantime, immediate steps will be taken by order of the Council to apprise all Minnesota judges, members of the Bar Association, and physicians of this action.

#### STATE LICENSURE OF LABORATORY TECHNICIANS

OLDER physicians may recall the days, not so long ago, when clinical laboratory service consisted mainly of simple routine procedures which any young woman of average intelligence could easily learn and carry out. No essential educational background or systematic instruction and training was deemed necessary to qualify her for the task. At best, her training embraced a short period of apprenticeship. Known as laboratory technician, she was able to adequately meet the needs of her days and was often considered competent or even indispensable.

However, with the rapidly widening scope and increasing complexity of the present day practice of laboratory medicine which intimately evolves

around the practical application of the principles of all fundamental sciences, it had become increasingly apparent that the laboratory technician of those days with her limited preparation could no longer satisfy the demand of the modern clinical laboratory.

In order, therefore, to adequately insure the aid of properly trained technical workers and thus safeguard the practice of clinical pathology, the American Society of Clinical Pathologists, in 1928, created a Board of Registry of Medical Technologists whose function was to clearly define the qualifications of laboratory workers and to issue certificates of registration to those who came within that definition, and voluntarily submit to the examination. The present requirement consists of two years at least of college work with the necessary credits in chemistry, biology and bacteriology and a year of practical instruction and training in a clinical laboratory approved for such training by the American Medical Association and the American Society of Clinical Pathologists.

The American Medical Association, the American College of Surgeons and other medical organizations have wholeheartedly endorsed the Registry's program and encouraged all approved hospitals to employ registered medical technologists in their clinical laboratories in preference to those who do not possess the minimum qualifications required by the Registry.

In the past decade, the services of the qualified medical technologist have become increasingly indispensable to the practice of clinical pathology. She has gradually supplanted the old time laboratory technician of yesterday.

Thus, in the twelve years that have elapsed since the establishment of the Registry and solely through its efforts, the laboratory worker has been transformed from a non-descript lay-helper to a scientifically trained professional who plays an important rôle in every day practice of medicine. This has clearly demonstrated not only the wisdom of the American Society of Clinical Pathologists in having initiated the system of voluntary registration of qualified laboratory workers but also the value, professionally and economically, of such registration to the registrants themselves.

Today, the Registry of Medical Technologists of the American Society of Clinical Pathologists, with its six thousand registered members, is an

established institution of national importance enjoying the confidence and support of representative medical organizations.

Unfortunately, there are a large number of laboratory workers who by reason of their inadequate education and training are unable to qualify for registration. These and other disgruntled elements are making organized effort to discredit the work of the Registry, whose alleged "dictation" they resent, by banding themselves together, ostensibly for the purpose of obtaining state legislation to license all laboratory workers in every state in the Union but actually to nullify the already well established nation-wide voluntary system of registration sponsored by the Registry.

The American Society of Clinical Pathologists, after careful investigation, has come to the conclusion that the present system of universal voluntary registration of qualified laboratory workers by a responsible national agency, no matter who may conduct it, is more effective in maintaining their scientific and ethical standards than any method of individual state licensing.

Such a law, if enacted, will inevitably lead to several undesirable consequences. The chief among these, which vitally concerns the practice of clinical pathology, would be the lowering of the standard of qualifications of the eligibles in order to allow the advocates of this legislation to qualify, the majority of whom can not meet the minimum requirements of the Registry. This would naturally bring down their professional standard, which in turn would defeat the very objective of the proponents of the legislation, namely, to bring about a better economic status for the average laboratory worker.

Another undesirable feature of legal licensing would be the substitution of the present universal voluntary system with its twelve-year record of successful operation, by untried, compulsory state laws necessitating forty-eight or more separate and unequal standards of qualifications and regulations which would be the source of unending confusion. On this point, Doctor W. D. Cutter, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, made the following statement: "It was determined that the Council was in no position to feel that a state board of examiners in medical technology would represent any advance over present methods of control in this field. The ex-

perience of the Council in the licensure of physicians and the registration of nurses have indicated that statutory control in each of the forty-eight states would in the end be less effective than a central voluntary registration system."

There is also a possible danger of which the practicing clinical pathologist is apprehensive in the event a law of this kind is enacted, namely, a danger of permitting licensed laboratory technicians to feel capable of engaging in the practice of clinical pathology by operating or "taking charge" of a clinical laboratory without the supervision of a licensed physician.

There are a few among the laboratory workers in Minnesota, some well meaning, who apparently believe that their economic independence and well-being rests largely upon recognition by the state through compulsory licensing. By their desire to attain this goal they are apparently willing to sacrifice their professional standards. This is clearly evidenced by their readiness to join hands with the national group whose membership is composed of non-registered technicians including the so-called "graduates" of unapproved schools and others ineligible to register. This group, incidentally, is intimately identified with the American Medical Technologists, an organization composed of non-registered laboratory technicians recently formed by a male technician who conceived the idea of issuing certificates of registration to those who join it by paying a fee of \$5.00, which entitles the holders to identify themselves as medical technologists and suffix the letters M. T. to their names, making it impossible to differentiate them from the bona fide Registered Medical Technologists, certified by the American Society of Clinical Pathologists, the intent clearly being to confuse the minds of the medical public and embarrass the legitimate work of the Registry, the official agency of the organized clinical pathologists. (See Editorial Comment, *Jour. Am. Med. Assn.*, 114:1269, March 30, 1940.)

These facts are briefly outlined at this time so that physicians of Minnesota may be correctly informed of the movement, now being agitated by a certain group of laboratory technicians toward legislative enactment of a law governing the status of laboratory workers which the American Society of Clinical Pathologists as well as the American Medical Association considers ill-advised and unnecessary in view of the effective work which the Registry of Medical Technol-



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ogists is carrying on for the maintenance of scientific and ethical standards of qualified medical technologists.

KANO IKEDA, M.D.

Miller Hospital  
Saint Paul

### WILLKIE AGAINST SOCIALIZED MEDICINE

THE *Rocky Mountain Medical Journal* for September, 1940, printed the following letter, addressed to Dr. T. Leon Howard, Denver, Colorado, under date of August 7, 1940:

"My Dear Doctor:

You have asked my views on socialized medicine. I am against it. You can quote me any place on this.

Cordially yours,  
WENDELL L. WILLKIE

Concise and to the point. He is opposed to socialized medicine. His reply contains no "ifs,"

If elected there will be no more interdepartmental committees appointed by the president and composed of socialistically minded government employees who formulate, with only contempt for the opinion of the medical profession, bills for Wagner to submit to Congress. If elected, no more of Thurman Arnold and his suit of the medical profession for its alleged constraint of trade.

What a relief this would be.

C. B. D.

### SUGGESTED POLICIES AND PHYSICIANS' RECOMMENDATIONS FOR PUBLIC HEALTH NURSING SERVICES (Revised 1940)

EDITOR'S NOTE: The above regulations have been revised by the Public Health Nursing Committee of the Minnesota State Medical Association and have been approved by the Council of the State Medical Association and the State Board of Health. They are published here in full to serve as a guide for counties that may have occasion to employ health nurses.

#### General Policies

It is highly important that public health nursing practices be consistent with the medical consensus of the community, and for this reason it is suggested that each county medical society approve certain policies involving nursing procedures and instructions for the guidance of public health nursing.

1. Any agency employing public health nurses should have its program approved by the physicians in the community.

2. The nurse shall emphasize the importance of medical care but shall not recommend the selection of any individual physician. She shall not give nursing care after the first visit except under the direction of a licensed physician. Records of nursing care shall be kept on file by the nurse. In special cases of economic need the nurse shall use the facilities provided by public and private agencies in cooperation with the family physician.

3. The nurse does not diagnose nor prescribe treatment. It is her function to follow the instructions of a physician. Public health nurses working under the direction of local physicians may be allowed to give and read various diagnostic tests, provided approval has been given by the physicians in the community.

4. The nurse shall make a written report to the physician or agency whose patient she has contacted. Such report may be given to the patient to take to the physician, or may be delivered directly to the physician. Carbon copies should be kept on file—a standard blank form is suggested in the Nurses' Manual, supplied by the Minnesota Department of Health.

5. The establishment of clinics or other health activities which involve medical service shall be undertaken only upon the approval of the county or district medical society.

6. Every public health nurse shall understand and support the state health laws and regulations and shall keep in direct contact with the local and state health departments.

7. Every nurse engaged in public health nursing should be approved by the Committee on Certification, for which provision has been made in the Minnesota State Health Laws and Regulations, Section 5353-4, PP. 26.

8. The work of every nursing service shall be carefully and consistently recorded. The nurse shall in addition to such reports as may be requested by the local agency make written reports through the board employing her to the state and local boards of health in such form and at such times as shall be prescribed by the State Board of Health.

9. It is suggested that all public health nurses at the time of employment, and periodically as requested by the employing agency or the State Board of Health, present a satisfactory personal health record that includes recent smallpox vaccination, evidence of immunity to diphtheria, and freedom from active tuberculosis as determined by tuberculin tests and/or x-ray and other procedures as indicated.

#### Physicians' Recommendations

The following recommendations are submitted to physicians for their approval, to be used as a guide to the nurse in her administration of nursing care, treatment and medication in those emergencies where no physician is in attendance, when orders have not been left by the attending physicians, or when the nurse has been unable to reach the physician for orders. In cases which will probably not require the services of a physi-

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cian, the first aid treatment administered by the nurse should comply with that accepted as standard procedure by the American Red Cross.

Such recommendations should cover the general educational content of the nurse's teaching, as well as the procedures which she may perform. Physician's standing orders to nurses are concerned with:

- (1) Teaching content of health education in the home and school as regards the health and environmental sanitation of the family.
- (2) Nursing care of sick persons under or pending medical direction.
- (3) The health of school children through the nurses' part in the school health program.

*Emergencies and Accidents.*—Only first aid should be given. In the event of a severe accident, immediate medical care should be secured by calling the nearest physician or hospital, if it is impossible to locate the family physician of the injured person. If the patient is a minor, communicate with parent or guardian immediately.

All nurses are expected to be familiar with the standard technique adopted by the American Red Cross for the first aid treatment of accidents or injuries, and in caring for such conditions before the arrival of the physician she will limit herself to these accepted procedures.

*Communicable Disease Control.*—If communicable disease is suspected the nurse should explain to the family the elementary principles of isolation, concurrent and terminal disinfection, and such other measures which will aid in preventing the spread of the disease in question. (See "Home Isolation Procedures" Manual for Public Health Nurses.)

If the patient is attending a school, the school officials should be notified in writing in order that those who have had contact with him may be properly observed and the health officers of the sanitary districts in which the school is located and in which the child resides should be notified of the occurrence of suspected communicable disease as provided by Regulation 318 of the Minnesota State Health Laws and Regulations.

In the presence of suspected communicable disease the nurse is expected to make the patient as comfortable as possible, isolated from all other persons. Any of the following symptoms shall be considered sufficient reason for such isolation:

Fever 100° or more  
Sore throat  
Coryza  
Vomiting  
Rash  
Inflamed eyelids  
Running ears  
Skin lesions, suggesting scabies or impetigo  
Pediculosis

In aiding physicians in the control of preventable diseases public health nurses are expected to cooperate with the local health officer and to follow the Regulations of the State Board of Health as outlined in Chapter 6 of the Minnesota State Health Laws and

Regulations as issued by the Minnesota State Board of Health, 1938.

*Immunizations.*—The nurse should teach families that smallpox vaccination and diphtheria immunization should be done as early as possible, preferably before the end of the first year.

The administration of vaccines and other biologic products for the prevention of certain communicable diseases is the responsibility of the physician. Group immunization programs should be conducted under the auspices of a local medical society who may secure available biologics from the Minnesota Department of Health. The nurse's contribution to such programs involves preliminary education of the community, making the necessary arrangements for carrying through the programs, assisting the physicians when the immunizations are being performed, summarizing reports, and keeping local records of immunizations given.

*Syphilis and Gonorrhea.*—"Reg. 2512. All persons infected with a venereal disease shall continue under treatment or proper observation until no longer able to transmit the infection. In the case of gonorrhea this shall be until all clinical and microscopic evidence is negative.

"In the case of syphilis this shall be until all clinical and laboratory evidence is negative and sufficient treatment to reasonably insure a cure has been taken."

As problems in relation to syphilis and gonorrhea are encountered or brought to the attention of public health nurses, all available information regarding these problems should be referred to the Division of Preventable Diseases, Minnesota Department of Health, for consultation and advice regarding future responsibility of the nurse. Where cases are known to be under medical care, problems relating to them should first be discussed with the attending physician.

Any follow-up work done by public health nurses on cases brought to their attention should be reported to the Division of Preventable Diseases on a special form (L.N.G.) supplied for that purpose.

Public health nurses should always bear in mind that information relating to venereal disease should be kept confidential. See Regulation 2510, P. 63, Minnesota State Health Laws and Regulations.

*Tuberculosis.*—Infectious and potentially infectious cases (active or with tubercle bacilli in sputum) should be isolated preferably at a sanatorium following the diagnosis and recommendation of the attending physician or health officer. Such cases while awaiting admission to the sanatorium should be completely isolated at home. (See communicable disease isolation procedure in Public Health Nursing Manual supplied by the Minnesota Department of Health.) Special attention should be given to adequate terminal disinfection after patient has left the household. Hospitalization may also be advised for other forms of tuberculosis.

Medical examinations, including tuberculin tests and x-ray films, if necessary, should be urged for all other

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members of the family and other close contacts.

**Maternity and Child Health.**—The public health nurse's work with mothers and infants should constitute an important part of the program. Group classwork offers a convenient medium for reaching large numbers of mothers and creating a general understanding of good habits of maternal, infant and child care. The nurse should discriminately distribute educational literature available from the Division of Child Hygiene, Minnesota Department of Health, and stimulate effective use through explanation and demonstration of the information. The public health nurse will find it desirable to secure standing orders from individual physicians for treatments and nursing procedures to be carried out for their patients.

In working with *expectant mothers* the aim should be to bring the patient under early and continuous medical care, to teach the elements of prenatal hygiene, and to carry out nursing care or treatments ordered by her physician. The nurse should help the mother plan for delivery and reception of the new baby. These preparations, and particularly the making of sterile supplies, are important when home delivery is planned.

For *obstetrical patients* nursing care may be given to mother and newborn infant. Every nurse should be concerned with the prophylactic protection of the infant's eyes and the registration of birth as required by state law. In the event of postpartum hemorrhage send for the physician at once, massage uterus against scutum, elevate the foot of the bed, and keep patient quiet and warm.

Nursing care, such as bed bath and perineal cleansing, may be given to *postpartum patients*, as well as any treatment ordered by the physician. The nurse should emphasize the value of rest during the involution period and other aspects of hygiene, the value of the postpartum medical checkup, and teach the value of breast feeding.

*Infants and preschool children* should be visited to give instruction on diet, general hygiene, and immunizations. For the *premature* infant being cared for in the home, the field nurse can be of considerable assistance in making arrangements for maintaining the body temperature, feeding, isolation of the infant, and the giving of nursing care. The birth of a premature infant may create an emergency and obviously the best results will be obtained where the nurse is prepared and cooperating with the physician under a definitely prearranged program.

**School Health.**—Public health nurses in school health work are under the immediate direction of the school administration. It is recommended that a school health council be appointed with medical and dental representation to help guide the policies of the service, especially as they apply to medical and dental relationships. School nurses cooperate with physicians and dentists to improve the health of school children by means of

health education directed toward children and their parents and by consultation with parents on problems of child health and environmental sanitation.

The school nurse aids in controlling the spread of communicable disease by helping teachers recognize suspicious symptoms in children and recommending immediate separation from other children and exclusion from school until proper authorities have readmitted them.

"Reg. 318. All . . . pupils shall be reported to the school physician for medical examination unless in the opinion of the head of the school the pupil's condition requires that he or she be sent home immediately or as soon as a safe and proper conveyance can be found.

"In such cases the pupil shall be sent home and the health officer of the sanitary district concerned shall be notified immediately by the head of the school.

"In the districts where there is but one teacher for a school and in schools where there is no school physician or in the absence of the regular school physician it shall be the duty of the teacher or head of the school to exclude from school all pupils, who, in his opinion or that of the school nurse" appear to be ill or show signs of a communicable disease "and to report same to the board of health of the sanitary district in which the school is located and to the board of health of the sanitary district in which the pupil lives. The teacher shall continue to exclude such pupils until a properly signed certificate is presented from the health officer in each case.

"(Note.—A school nurse may perform the duties outlined, under the supervision of the health officer when there is no school physician.)"

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### GOVERNMENT TO NEED TEMPORARY AND PART-TIME CIVILIAN MEDICAL OFFICERS

The expansion of the Army creates a need for about 600 civilian medical officers in various grades for temporary and part-time service. The duties of full-time officers will be to act as doctors of medicine in active practice in hospitals, in dispensaries, and in the field. The duty of part-time officers will be to report for sick call at a fixed hour each day and to be subject to emergency call at all times.

The Civil Service Commission in making this announcement calls particular attention to the fact that part-time officers will be able to continue their regular practice. In order that this may be done, appointments to the part-time positions will be made of medical officers in the vicinity of the place of duty.

Information concerning these positions may be obtained from the Secretary of the Board of U. S. Civil Service Examiners at any first- or second-class post office, or from the United States Civil Service Commission, Washington, D. C. Physicians are urged to apply at once. This work is of the greatest importance to the success of the National Defense program.

# MEDICAL ECONOMICS

Edited by the Committee on Medical Economics  
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

## THE COUNCIL MEETS

### Doctor and Defense

Medical problems of national defense chiefly occupied the Council at their fall meeting held Sunday, September 22, at the St. Paul Hotel.

Are a sufficient number of physicians available to take care of military needs and also to serve the civilian population?

What will be done with culls who are eliminated by the draft boards for physical defects?

What is to be done if blood tests for venereal disease and treatment of enrollees showing positive Wassermanns are required?

Will physicians be compensated for their work as draft board examiners?

What can the medical profession do to oppose demands for state medicine that will inevitably be made on a basis of total defense for the nation?

### Answers Sought

Answers to these and many other questions are being sought by officials in charge of medical participation in national preparedness. In the nature of things they cannot all be answered now; but the following pertinent information was presented to the Council by Dr. A. J. Chesley, Secretary of the State Board of Health and Dr. H. S. Diehl, Dean of Medical Sciences at the University of Minnesota, both of whom have just returned from military conferences:

### Must Give Preference

**Dr. Chesley:** The time factor in our preparedness is crucial. We are late, as always, and we can only hope that an act of God will save us this time as it did before. The problem that faces us today is the most important that ever faced the United States and the

medical profession and we must give preference to military preparedness before everything else in our program.

### "Serious Situation"

"The majority of our trained personnel in the State Board of Health are in the Reserve or National Guard. We face a serious situation within the Department and outside the Department in all the health and sanitary departments in the state since, not only training but familiarity with local sanitary problems are essential to the smooth running of our services. The possibility of depleted personnel for these services must be faced.

"If all of the medical service suggested in some quarters for draftees is given, furthermore, it will require more physicians than there are in the United States to deliver it. For instance, if blood tests for venereal disease should be required as suggested for each man, the need for laboratory service and for competent medical service to interpret findings and undertake treatment would be immense.

### Is Test Essential

"We will do what is required of us in Minnesota if we can; but it is a question if the venereal disease problem needs to be tackled on this scale. In the Army games and maneuvers in Wisconsin, for instance, it was discovered that venereal disease among the guard regiments encamped was about one-hundredth of what it is in the regular army.

"Is it essential, on that basis, that every man drafted be tested for venereal disease? And if he is, how is treatment to be given to those found infected? What is to be done about those who are found unfit, for other reasons, for service? Some solution to that problem will be demanded and the medical profession must be ready for it or—possibly—see



state medicine moving in unchallenged behind the draft."

### Student Service

**Dr. Diehl:** As you know, all student service has been deferred for a year. First year internes will not be called and the probability is that all medical students will be allowed to complete their medical training or that student army training corps will be established at the schools.

### 8,000 Needed

"It is estimated that about 8,000 doctors will be needed out of the Reserve immediately this next year. About 11,000 are available in the National Guard and in the Reserve, and no more enlistments are accepted now in either, though negotiations are underway to reopen enlistment to medical men in the Guard.

"Those who are drafted and who are not in either the Reserve or the Guard will enter the service as regular enlisted men but will undoubtedly be transferred into the Medical Corps as soon as possible.

### "No Compensation for Examiners"

"This is undoubtedly a long-time preparedness program and the probability is that essential teaching members of medical school staffs will not be assigned to military duty.

"It was assumed at the start that pay for medical examiners would follow the regulations of 1917. According to present plans, however, there will be no compensation for these examiners though discussions on this matter have not yet been concluded and the decision may not yet be final."

It was suggested that information brought to the Council by Dr. Chesley and Dr. Diehl, particularly problems which may involve government medical services to rejected enrollees, be submitted to the Committee on Medical Economics for study and discussion.

## PREPAREDNESS CONFERENCE

A conference of great importance to national medical defense was held last week in the Headquarters Building of the American Medical Association in Chicago. Taking part in this Conference were Chairmen of the State Committees on Medical Preparedness, members of the National Committee on Medical Preparedness, rep-

resentatives of the Army and Navy and the United States Public Health Service, members of the Board of Trustees and officers of the American Medical Association.

One could not avoid being impressed with the enthusiasm and unselfish spirit of intelligent cooperation manifested by all of those assembled. The progress in medical preparedness made by the united efforts of the profession under the guidance of the American Medical Association, in cooperation with the Federal Bureaus, was most reassuring and should answer those who are skeptical regarding a democratic form of government. If all other activities were developing as rapidly as that of medical preparedness, national defense would be much farther advanced.

### Main Objective

The officers of the American Medical Association are at present making the matter of medical preparedness their main objective. It is a prodigious task to assemble data concerning more than 160,000 physicians in the United States and to make such data available for practical purposes. Already more than 100,000 information cards have been turned in by physicians and it is the hope of the Bureau that the return will be 100 per cent. In order to carry on this great task the Bureau of Medical Economics, under the capable leadership of Dr. Leland, has greatly augmented its staff and is devoting its entire time to this purpose. Other problems affecting medical economics will, for the present, have to await the completion of this most important task.

### Pamphlet Will Be Prepared

As previously announced, preparations are being made by Dr. Fishbein to publish a pamphlet, beginning the first of the year, which will be devoted to news and developments affecting military medicine. This will make available the rapid transmission and co-ordination of recent developments in all fields of medicine.

### Efforts Hampered

Many officers of the American Medical Association find themselves in a rather anomalous situation in that in spite of their unselfish and able cooperation in defense of their country, they soon will be hailed into court in Washington, D. C. to defend themselves against the charge of conspiring to violate the federal laws of trade. It will be necessary for many of the officials of the A.M.A. to move to Washington and establish temporary headquarters there for an

indefinite period of time, since they will be held liable to summons any time after October 21. This will naturally hamper their efforts to carry on in the interest of medical preparedness.

### Medical Committee Appointed

It is of interest that the national cooperating Committee on Medical Defense has finally been appointed by President Roosevelt. This includes the Surgeon Generals of the Army, Navy and United States Public Health Services, Dr. Weed, representing the Council on Medical Research, and Dr. Irvin Abell, representing the A.M.A. as Chairman. Apparently considerable controversy arose in inner governmental circles as to the advisability of appointing Dr. Abell; but the matter was finally decided in his favor. He holds the unique position of being Chairman of the Committee on Medical Preparedness which was appointed by the House of Delegates of the A.M.A., Chairman of the Board of Regents of the American College of Surgeons, and, as Past President, is a direct representative of the American Medical Association. American medicine is indeed fortunate to have a representative so able, not alone in his profession but in an executive capacity and as a diplomat, to represent its cause. He enjoys the confidence not only of his colleagues, but of the officers of the various federal health activities and other governmental leaders. Needless to say, his efforts will be ably aided by the officers of the A.M.A.

### Test Proposed

One of the most interesting contributions to the program was included in the discussion by Surgeon General Parran of the United States Public Health Service. He proposes to have serologic test for syphilis included in the medical examination of every recruit. The suggestion would seem to offer a wonderful opportunity to determine the incidence of syphilis, to give it adequate treatment, and to go a long way towards its eradication. Whether or not, it is feasible and whether it will interfere with induction of the troops into service remains to be seen.

One thought occurs to those of us who are interested in maintaining the present form of the practice of medicine, and that is whether such examinations which are not strictly necessary, and which are made without charge by governmental agencies, will act as an example and open the

way to more extensive federal methods of examination and therapy.

W. F. B.

### MINUTES OF THE CONFERENCE

The meeting of the State Chairmen of the Committee on Medical Preparedness of the American Medical Association held at the A.M.A. Headquarters in Chicago on Friday, September 20, 1940, was called to order by Dr. Paullin, Secretary of the Committee on Medical Preparedness. The roll call revealed that most of the states were represented by their chairmen of the Committee on Medical Preparedness.

Col. Charles B. Spruit from the Surgeon General's office of the War Department spoke of the selective draft program, explaining the various set-ups from the local board and its personnel to and including the Induction Board of the Army. He discussed the various classifications of selectees. In the course of the discussion he stated that the local medical examiner could not examine relatives; that the local board would be privileged to call in a physician in an advisory capacity. It was felt that the civilian physician who is in the second or third class would be the logical one to call for such duties. The status of the examining physician will be that of a government official without pay. The local examining physician cannot be a member of the armed force of the nation. The government has ruled that only practitioners of medicine can conduct examinations.

### Medical Society to Indorse

A question arose as to the priority of reserve officers who would not be available for one reason or another, due to local circumstances and who would be placed on a priority list. When such men are called an endorsement will be made by the local medical society to the surgeon of the corps area from which the call came. He will in turn transmit this to the Surgeon General's office through military channels, and the Surgeon General will make the final decision. (In other words, if a reserve officer has assumed some obligation and is unable to get away at the time, the county society can state the reason to the surgeon of the corps area so that the applicant may be put on the low priority list.)

Internes in hospitals will not be called until

one year of service has been completed. They will also be placed, therefore, on a low priority list. Resident physicians, on the other hand, who are in their last few months of service, will be in the high priority list, subject to call. Students entering medical schools will not be drafted for at least one year. Registration of all students in the College of Science, Literature and the Arts will be necessary, but deferment will be made until July 1, 1941. Cadets of the Senior R.O.T.C. of the Army and Navy are exempt from registration.

### No Group Deferments

There will be no exemption of any groups or agencies and deferment will not be made on any group basis. The merits of each individual case will be decided upon by the local board.

In case of a public health officer in a community being called, the State Board of Health will be consulted and will give its endorsement relative to the induction of such an official in a local community.

The Advisory Board is composed of specialists who will act in such capacity when called upon by the local examining board's physician.

### Appeals

The Appeal Board, one for every 600,000 population, will review such matters as come before it in regard to individuals who do not wish to be inducted. Their decision will be final.

It was suggested that patriotic bodies, such as the American Legion, should use their influence to encourage selectees in registering.

### Psychiatric Problems

The importance of neuropsychiatry was touched upon. Dr. Parran stated that 2.2 per cent of those inducted into service in the last war had evidence of neuropsychiatric lesions and that 2.2 per cent of every 400,000 men enlisted would eventually be government charges. It has been calculated that each individual costs the government \$30,000. In other words, in an army of 1,200,000 men the cost would be \$657,000,000.

### Recruits to Be Radiographed

Col. Love of the Surgeon General's office stated that there would be approximately 15,000 men in the medical reserves, of whom 8,000 would be required by July 1, 1941. He also stated that x-ray examination of the chest would

be made in the case of all recruits before they are finally inducted and again at the time of discharge from federal service. These films are usually the 5 x 7 size, but Capt. Sutton stated that the Navy would use the 35 mm. film.

### Navy Needs

Capt. Sutton, representing the Surgeon General of the Navy, stated that the Navy was having no difficulty in procuring the number of enlisted personnel up to the present time; that eventually 500,000 enlistments would be required for the naval services and that these would be trained in eight or ten training stations in the United States. There are 1,100 vacancies in the naval reserve and 208 vacancies in the medical corps of the Navy. The Bureau prefers the commissioning of recent graduates.

### First Induction

The first induction will be that of 375,000 registrants. There will be 143,000 registration precincts in the United States. There will be 3,717 registration precincts in the State. There will be 412 in Hennepin County, 250 in Ramsey County, 242 in St. Louis County, and the remainder will be distributed throughout the state. There will be approximately 140 draft boards in the state. There will be 6,500 draft boards in the United States. Practically 16,500,000 men between the ages of 21 and 35 years will be examined. Out of every 100 men 63.7 per cent will be accepted.

The report of September 18 relative to the response of physicians to the questionnaire on Medical Preparedness reveals that the Seventh Corps Area, which includes Minnesota, has had the largest number of returns. On that date Minnesota had a return of 81.4 per cent.

F. L. SMITH

### ATTACK BY AIR

With the shrewdness and determination worthy of a better cause, the Department of the Interior is now making use of the defense emergency to reform medical services to the civilian population.

Radio is the medium and the program which carried one telling blast was part of a series entitled, "This, Our America." It was called "Health and Education" and it was carried over the Blue Network August 21, 1940.

To begin with it is interesting to note that the government gives education in America a rating of 100 per cent both as to aims and accomplishment.

### **Inadequate Service Charged**

Medical aims and accomplishments rate, by contrast, a small amount of perfunctory and grudging praise and a large amount of blame for inadequacy of services to one-third of the population with annual incomes under \$750.00, to mothers, to cancer sufferers, to workers in industry. By inference, indeed, medicine is accused of over-charging and of poor service generally to low income patients.

These programs are prepared and staged with all the latest radio tricks. Music and alternative narrators are used in the "Health and Education" broadcast, with a character named "Joe Average Guy" to ask questions and four victims to tell their distressful tales of neglect.

It is hard to see how any average layman who heard it could fail to be convinced of a terrible lack of medical and hospital services in this country. Most would hear between cues an equally terrible indictment of the medical profession for inertia and inability to handle its own problems—if nothing worse.

### **School System Praised**

Many valid and even formidable criticisms of our educational system are heard within and without the ranks of educators these days but the Department of the Interior emphatically finds no fault or deficiency with the school system of the United States as a factor in our national defense.

Somewhat similar though less objectionable programs are also being offered to radio stations currently by the United States Public Health Service. One of these, recently submitted for study to the Committee on Radio, was a plea for earlier diagnosis of cancer and, incidentally, for more facilities where expert treatment might be available at little or no cost to patients. The Committee has not approved this program.

### **If War Fever Grows**

The danger in all this is clear. Where the Wagner bill was halted in committee on its merits, a new health bill embodying actual state medicine as a defense measure will not be argued upon its merits at all, but upon its fancied con-

tribution to the total preparation for war. When and if war fever grows in the United States it may quickly become an act of treason to argue against any ill-conceived and unwanted measure for civil reform, if only it can be proposed in the name of national defense.

## **PROFESSION MUST ACT**

Complete medical care for workers, particularly those engaged in defense industries, should be an integral part of the program of the National Defense Advisory Commission according to the Bureau of Co-operative Medicine, Dr. Kingsley Roberts of New York, medical adviser.

A statement to the Commission is printed in full in a recent bulletin from the Bureau in which attention is called to accumulated evidence gathered during the last ten years to prove that "we cannot rely upon present methods for the purchase and distribution of medical care."

"Industrial medical services to care for occupational injuries and illness are too limited to meet the need for increased efficiency," says this statement. "A proper program can admit of no less than complete medical care."

"With such a program there is reason to believe that absenteeism due to illness might be substantially reduced. A reduction of one quarter would have the direct effect of adding to our resources of skilled labor about six men for each thousand employed, or a saving of about 1,700 work days per year for each 1,000 men. The indirect effect of improved health upon productive capability is incalculable.

"As both labor and industry have a stake in the health of the worker, the role of the government should be to facilitate the initiation of organized medical services for these groups."

### **Danger Acute**

Obviously from the above, there is a job to be done by organized medicine. Private advocates of compulsory sickness insurance, no less than government agencies, are losing no time in tying increased government medical services to defense measures. The danger to American medicine is acute. Physicians who see the danger will have to act as a body, definitely and promptly, not only in Washington but at the polls in November.



# "ESSENTIAL INSURANCE"

(Monthly Editorial Prepared by the Medical Advisory Committee)

The carrying of liability insurance by drivers of automobiles is just as necessary the first hour of driving a new car as it is after years of use of the same car, the possibility of accident being just as great at one time as another.

Likewise, the possibility of a suit being brought against the beginner in the practice of medicine is just as likely, because of alleged malpractice, the first day of practice as it may be at any time during his professional career.

Most of the companies writing liability insurance in Minnesota have as one of their prime requisites that a purchaser of a policy be a member of his county and state society in good standing. This is rightly so but tends to work a hardship on the beginner in practice who may wish to buy a policy.

Your Medical Advisory Committee believes that to avoid this injustice a more liberal interpretation might be advanced by the companies under the following requirements:

1. That the applicant be licensed to practice in the state of Minnesota with the title of Medical Doctor.
2. That he make arrangements (the rental of an office, purchase of furniture, etc.) to become a settled practitioner in the community he proposes to practice in.
3. That he do nothing in the way of advertising to promote his acceptance in the community.
4. That investigation show him to be a man of high moral character, who from an ethical standpoint would become a valuable member of his medical society.
5. That after investigation, the president and the secretary of the County Medical Society must be willing to recommend him.
6. That he show his intention of becoming a member of organized medicine by filling out a tentative application for the county society at the time that the insurance company writes his policy, it being understood that the rules and regulations as to time of admittance into the county society are governed by the by-laws of that society and the approval of the board of censors.

7. That it be understood by him and the insurance company that if he is not elected to membership in the county society, the insurance policy which is issued to him becomes null and void and the unearned premium will be returned to him.

It might be well for the secretaries and members of component county societies to invite at once new men in their communities to medical meetings. This will promote future membership and give the newcomer in the community a feeling of the fellowship so necessary in these troubled times.

B. J. B.

## MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Saint Paul, Minnesota

J. F. Du Bois, M.D., Secretary

**Fake Doctor Pleads Guilty to Petit Larceny in St. Paul**  
Re. State of Minnesota vs. Edward Alvin Johnson, also known as Edward Alvin Yonnson.

On September 5, 1940, "Dr." Edward Alvin Johnson, twenty-eight years of age, who gave his home address as Inglewood, California, entered a plea of guilty in Municipal Court of Saint Paul, to a complaint charging him with the crime of petit larceny. The charge was based on the theft by Johnson of a physician's stethoscope from a Saint Paul Hospital on August 23, 1940. Johnson was arrested



at 1469 Lafond St. by members of the Saint Paul Police Department, on August 29, 1940, following their investigation into the theft of the stethoscope. Judge Robert V. Rensch sentenced Johnson to sixty days in the Saint Paul Workhouse and suspended the sentence upon Johnson's statement that he desired to return to his home in California where he stated that his mother and wife resided.

Johnson stated that he left Los Angeles for Saint Paul on August 5, 1940. Upon his arrival in Saint Paul he posed as a physician and visited at four Saint Paul hospitals, where he claims he viewed two surgical operations and one birth delivery. Johnson also admitted that he had represented himself as a doctor in Los Angeles. At the time of Johnson's arrest members of the Saint Paul Police Department found a prescription book in his room and a number of surgical instruments and various medicinal preparations. Johnson was arrested before he had an opportunity to examine, or treat, any patients, consequently he was charged with petit larceny rather than with practicing medicine illegally. The only excuse offered by Johnson for his fraudulent representations was that he enlisted in the army in 1934, and was assigned to the medical corps as a hospital orderly. He claims to

have studied pre-medical subjects at Golden Gate Junior College, San Francisco, California. He told the Saint Paul Police Department that he was married on July 28, 1940, to a former Wavonia, Minnesota, girl who graduated as a nurse from one of the Saint Paul hospitals.

Johnson was interviewed by a reporter for a Saint Paul newspaper and told a rather elaborate story of having spent three years in Alaska with the United States Public Health Service. He claimed to hold memberships in numerous scientific organizations and that he received his medical degree at Berkeley, California. It subsequently developed that the entire story was false.

The Minnesota State Board of Medical Examiners wishes to caution the medical profession, and the hospitals as well, about the responsibility that attaches when an unlicensed person is permitted in an operating room or in a delivery room. Without the consent of the patient such an act is an illegal invasion of the privacy of the patient and can result in a serious lawsuit. It is a simple matter to make inquiry with respect to an individual's status from the standpoint of medical licensure. Satisfactory proof of a licensure should be required in every instance when a stranger represents himself as a physician. The Minnesota State Board of Medical Examiners is only too glad to co-operate with every physician and every hospital in the State of Minnesota in making impossible any such situation as occurred in this case.

#### Quack Doctor Fined \$1,000.00 at Rochester, Minnesota

Re. State of Minnesota vs. William F. Awe.  
William F. Awe, fifty-three years of age, who gave Denver, Colorado, as his home address, and who stated that he was one-fourth Cherokee Indian, was sentenced on September 21, 1940 by the Honorable Vernon Gates, Judge of the District Court at Rochester, Minnesota, to pay a fine of \$1,000.00 for practicing healing without a basic science certificate. Judge Gates ordered that Awe be confined in the Olmsted County Jail until such time as the fine is paid, not exceeding six months.



Awe was arrested on September 14, 1940, by Detective George Rohde of the Rochester Police Department, and E. L. Antletz, Agent of the Minnesota Bureau of Criminal Apprehension, following the discovery that Awe was treating an eight months old Chester, Iowa, baby for eczema for which Awe was to be paid \$40.00. The method of treatment consisted of bathing the baby in mineral water and also giving some of the mineral water internally. The Minnesota State Board of Medical Examiners was immediately notified and on September 17, 1940 Mr. Brist filed a complaint against Awe in behalf of the Medical Board, following which Awe was arraigned in the Municipal Court at Rochester, Minnesota, before Judge Burt W. Eaton. Awe waived a preliminary hearing and was held to the District Court with bail being fixed at \$1,000.00.

At the time of his arrest, Awe was accompanied by a twenty-four-year old Burlington, Colorado, girl who stated that she was acting as his secretary. The investigation disclosed that Awe obtained the mineral water, also some so-called mineral earth, at South Bend, Texas. Awe represented the mineral water and mineral earth as being a cure for blindness, cancer, eczema, rheumatism, kidney trouble and many other

ailments. Awe sold the mineral water at \$15.00 per gallon and the mineral earth at \$1.00 for a four-ounce jar. The mineral water cost Awe 35 cents a gallon, and he obtained the mineral earth at no expense to him. Awe admitted that he had been arrested four times previously, once in South Chicago, Illinois, twice in Milwaukee, Wisconsin, and once at Anoka, Minnesota, the last three arrests being for bootlegging. Awe admitted that he had no training in medicine, pharmacy, or any other form of healing. Awe's only explanation to the Court for attempting such illegal practices was his need of money. After denouncing the defendant in no uncertain terms, Judge Gates imposed the maximum fine permitted under the law. Awe was unable to pay the fine and was taken to the County Jail to serve his sentence.

The Minnesota State Board of Medical Examiners wishes to acknowledge the prompt and efficient work done in this case by Chief Harry N. Tompkins of the Rochester Police Department, Detective George Rohde of the same Department, and E. L. Antletz, Agent of the Minnesota Bureau of Criminal Apprehension. The Minnesota State Board of Medical Examiners also wishes to acknowledge the co-operation of Mr. Thomas J. Scanlon, County Attorney of Olmsted County.

#### Steele County Jury Acquits Woman of Massage Charge

Re State of Minnesota v. Harriet Hershberger.  
On September 13, 1940 a jury in the district court of Steele county brought in a verdict of not guilty in the case in which Mrs. Harriet Hershberger was charged with practicing massage without a license. The state introduced evidence to show that the defendant was giving massage treatments in her home at 422 E. Vine Street, Owatonna, and that she was paid \$1.25 per treatment. Mrs. Hershberger admitted that she was not licensed but claimed that she was just giving olive oil baths and divine healing. She also claimed to be a practical nurse. Notwithstanding the fact that none of the claims advanced by the defendant constitute a defense under the healing laws of Minnesota the jury found her not guilty.

The case was well tried for the state by Mr. Axel Anderson, county attorney of Steele county. The State Board of Medical Examiners requests that any evidence indicating that Mrs. Hershberger is continuing in her practices, be promptly called to their attention.

#### COUNTER PRESCRIBING A FEDERAL OFFENCE

It is worth every doctor's time to study thoroughly the provisions of the new Federal Drug and Food Act. The act is now in effect and places significant restrictions on the dispensing of drugs, particularly by the pharmaceutical profession. Drugs like the barbiturates and sulfanilamide are specifically restricted in their sale, and providing the druggist obeys the law, counter prescribing of such dangerous medicaments is definitely hampered.

Not only the druggist, but the doctor who dispenses these drugs from his office is affected by the regulation. Physicians who dispense drugs must go to the trouble of marking the complete name, dose, and other pertinent information on the package before giving it to the patient. Whether this portion of the law will be rigidly enforced must be proven by time, but it is well to note it is now a Federal Act that compels one to do so, and can be enforced.

Gone are the days when samples may be dispensed with careless abandon.

Bulletin Oklahoma County Medical Association.—

MINNESOTA MEDICINE

## OF GENERAL INTEREST

Dr. and Mrs. Ralph V. Ellis of Saint Paul vacationed for three weeks in Mexico in August. They visited in New Orleans on their return.

\* \* \*

Dr. Henry Michelson of Minneapolis, who received minor injuries in an automobile accident, August 11, is now fully recovered and has returned to his practice.

\* \* \*

Dr. Lawrence M. Larson of Minneapolis has been appointed medical examiner for the administrator of civil aeronautics of the Minneapolis district.

\* \* \*

Dr. Robert E. Mattison has opened offices at 1951 Medical Arts Building, Minneapolis. His practice will be limited to obstetrics and gynecology.

\* \* \*

Dr. George A. Pollock, who has been at the Mayo Clinic at Rochester, has returned to his home in Great Britain. His address is Peel Hospital, Clovensfords, Selkirkshire, Scotland.

\* \* \*

Dr. Richard M. Hewitt of Rochester was in Washington, D. C., August 26, to attend the meeting of the Committee on Information of the Division of Medical Sciences of the National Research Council.

\* \* \*

Dr. Northrop Beach, who recently completed an internship at Johns Hopkins Hospital in Baltimore, became associated with the University of Minnesota Hospitals as a medical fellow in pediatrics, September 1.

\* \* \*

Dr. Charlotte M. Gast of Memphis, Tennessee, has been appointed assistant professor and assistant director of the course in medical technology at the University of Minnesota.

\* \* \*

Dr. Edwin S. Fetcher, formerly of the University of Chicago, and Dr. Robert B. Dean of the University of Rochester, have been appointed instructors in the department of physiology, University of Minnesota Medical School.

\* \* \*

Dr. Karl H. Pfuetze, who has been on the medical staff at the Nopeming sanatorium at Nopeming for the past three years, has accepted a position as physician on the staff of the Mineral Springs Sanatorium at Cannon Falls.

\* \* \*

Dr. J. Willard Hanson, who has been a medical fellow in pediatrics in the University of Minnesota Hospitals, has accepted a position in the Health Service of the University of Kansas in Lawrence, Kansas. The appointment was effective September 1.

\* \* \*

Dr. H. S. Diehl was in Washington D. C. about the middle of September to confer with Dr. Thomas Par- ran, Surgeon-General of the United States Public Health Service on health phases of the preparedness program.

Dr. Walter G. L. Tanglin of Mahomen, Minnesota, has taken over the practice of Dr. Philip C. Noble in Polson, Montana. Dr. Noble, a graduate of Rush Medical College, has become a volunteer fellow in the University of Minnesota Hospitals, Minneapolis.

\* \* \*

The marriage of Dr. Rodney F. Sturley and Miss Jane Read of White Bear took place August 20. They are making their home in Minneapolis, where Dr. Sturley is a fellow in obstetrics and gynecology in the University of Minnesota Hospitals.

\* \* \*

A fine new hospital to serve the people of northern Minnesota was opened recently at Roseau. Known as the Budd Hospital, it is under the supervision of Mrs. Marie Budd, who for years has maintained a hospital there.

\* \* \*

Dr. C. O. Estrem of Fergus Falls recently suffered an attack of coronary thrombosis and has been a patient at St. Luke's Hospital in that city. He is convalescing very satisfactorily and expects to be able to resume his practice in a few weeks.

\* \* \*

Dr. L. Gordon Samuelson, who has been practicing in Mankato, left early in September for Carlisle, Pa., where he took a five-weeks' training course before reporting for duty in the medical detachment at March Field, California.

\* \* \*

Dr. Allen G. Johnson of Brainerd has taken over the offices and practice of Dr. N. J. Kulzer in Hastings. A graduate of the University of Minnesota Medical School, he completed his internship at St. Mary's hospital in Duluth in 1938. Prior to locating in Hastings, he practised in Duluth.

\* \* \*

Minnesota physicians who took part in the program of the nineteenth annual American Congress of Physical Therapy in Cleveland, September 2-8, included: Drs. E. V. Allen, Earl C. Elkins, Roger L. Kennedy, Philip S. Hench, Frank H. Krusen and Edward F. Rosenberg, all of Rochester.

\* \* \*

Dr. L. B. Wilson of Rochester, director emeritus of the Mayo Foundation, was principal speaker at the dedication of the beautiful new Museum of Natural History on the University of Minnesota campus, September 28. The dedicatory ceremonies took place at an open house in the evening. Other speakers included President Guy Stanton Ford, and James Ford Bell, principal donor of the museum. Completion of the Museum of Natural History is a dream come true for Dr. Thomas S. Roberts, director. A one-time practicing physician, Dr. Roberts has devoted many years in developing the museum.

## OF GENERAL INTEREST

Dr. L. L. Kallestad has located in Hutchinson, opening an office in the Ritter Building. Dr. Kallestad, who was graduated from the University of Minnesota Medical School in 1938, interned at the Minneapolis General Hospital. During the past summer, he took care of the practice of Dr. Arthur Thompson at Cokato.

\* \* \*

Dr. P. M. Mattill, assistant medical director of Glen Lake sanatorium, was chairman of arrangements for the eleventh annual homecoming for former patients of the sanatorium, September 14. The 300 visitors, all of whom have left the institution as cured, ranged in age from young folk to grandparents. The program included greetings by Dr. E. S. Mariette, superintendent.

\* \* \*

Colonel Kent Nelson, M.C., U.S.A., who before his retirement last spring was Seventh Corps Area Surgeon with headquarters at Omaha, has been recalled to service at his own request and has been placed in charge of the Medical ROTC unit at the University of Minnesota. Colonel Nelson was graduated from the University of Minnesota Medical School in 1900.

\* \* \*

Drs. J. A. Myers and Alex Blumstein of Minneapolis are scheduled to speak at meetings of the Minneapolis Nurses' Association, it is announced with the release of the organization's 1940-41 year book. Dr. Myer will give an illustrative lecture on "A South American Trip in the Air," November 13. Dr. Blumstein will speak March 12.

\* \* \*

A proposal for the establishment of a \$250,000 fund to be collected through public subscription throughout the world for a memorial to the late Drs. William J. and Charles H. Mayo is being considered by the Mayo Memorial Commission, composed of seventeen representative citizens of Minnesota. State Senator William B. Richardson of Rochester is chairman of the commission, being appointed by Governor Harold E. Stassen.

\* \* \*

Dr. Daniel F. McCann of Bemidji announces his association with Dr. T. P. Groschupf in the practice of medicine and surgery, effective October 1. Drs. Groschupf and McCann have their offices in the Barker building where Dr. Groschupf was located for a number of years in practice with the late Dr. E. H. Marcum. Dr. McCann has withdrawn from the firm of Drs. Johnson and McCann.

\* \* \*

The Albert Lea Medical and Surgical Center is the name of a newly formed clinic in Albert Lea, of which Drs. W. L. Palmer, C. F. Palmer, D. L. Donovan, L. C. Barr and H. B. Neel are members. The clinic is located in the Hyde Building on East William Street.

With the exception of Dr. Neel all have been practicing in Albert Lea prior to the formation of the clinic. Dr. Neel recently completed a fellowship in the Mayo Foundation where he was a Fellow in Surgery.

\* \* \*

Dr. John Mendenhall Snyder of Rochester, a fellow in surgery in the Mayo Foundation, accepted an invi-

tation of the trustees and General Alumni Society of the University of Pennsylvania to represent his alumni class at special convocations during the university's bicentennial celebration week. Dr. Snyder attended the School of Medicine at Pennsylvania, and is a member of the Class of 1934. As an alumni representative, he led his class in an alumni parade which was part of the program.

\* \* \*

Renewed interest in the Minnesota Medical Foundation is reported by Dr. Erling S. Platou, president. The Foundation is sponsored by the Alumni Association of the University of Minnesota Medical School.

Already \$25,000 has been subscribed to the foundation for the benefit of needy superior medical students, and for aiding in worthwhile research projects for alumni.

\* \* \*

Taking part in the dedication of a new 25-bed hospital in Warroad, recently, were Dr. A. F. Branton of Willmar, secretary, and Ray Amberg of Minneapolis, president of the Minnesota Hospital Association. This modern concrete hospital was built by WPA at a total cost of \$84,820, of which \$25,551 was contributed by the Village of Warroad and \$5,000 by the State of Minnesota through its Legislative Emergency Committee.

\* \* \*

Dr. Charles F. Code, a former fellow in the Mayo Foundation, has been named a member of the staff of the Mayo Foundation and Clinic at the Institute of Experimental Medicine. Dr. Code was assistant professor of Physiology at the University of Minnesota Medical School from 1938-1940. During his fellowship in the Mayo Foundation, he studied in London as a Bayliss-Starling scholar. While there, he was lecturer in physiology in the University College.

\* \* \*

In Ogden, Utah, the latter part of August to address a meeting of the Utah State Medical Association were Drs. J. T. Priestley and W. C. MacCarty of Rochester. Dr. Priestley presented two papers entitled "The conservative surgical treatment of stag-horn renal calculi" and "Carcinoma of the bladder with particular reference to total cystectomy." Dr. MacCarty spoke on "Is pernicious anemia a sign or a disease?" and "Classification of goiter."

\* \* \*

"Common Communicable Diseases" is the Health Subject of the month. Special emphasis is being placed on scarlet fever, whooping cough and measles. Physicians may secure the monthly health packets from the Minnesota State Medical Association which distributes the bulletins as part of its Co-ordinated Medical and Public Health Education Program. The medical broadcasts by Dr. W. A. O'Brien tie in with the program.

\* \* \*

"The Periodic Health Examination of the School Child" and "Tools of Health Education" are the subjects selected for the 1940-41 Continuation Study on Public Health Nursing. Centers for the three meet-



## OF GENERAL INTEREST

ings to be held in November, December and January are: Duluth, Virginia, Bemidji, Crookston, St. Cloud, Mankato, Rochester and Minneapolis, it is announced by Olivia T. Peterson, R.N., director of the Minnesota Department of Health, Division of Public Health Nursing.

\* \* \*

Speakers at the thirty-fifth annual convention of the Minnesota Nurses' Association in Saint Paul, October 16, 17 and 18, will include Dr. Ralph W. Warnock of Saint Paul, whose topic will be "Heart Disease," and Dr. Herman E. Hilleboe of Saint Paul, medical coordinator for the Department of Social Security, Division of Social Welfare. The latter will discuss "The Proposed Public Health Program for the Prevention of Heart Disease Among Children."

Affiliated groups meeting with this association are the Minnesota League of Nursing Education and the Minnesota Organization for Public Health Nursing.

\* \* \*

Dr. Peter D. Ward, superintendent of the Charles T. Miller hospital in Saint Paul, was reelected to the board of trustees of the American Hospital Association at its forty-second annual convention in Boston.

At the convention Dr. Ward presented a paper on "The Interdependence of Hospitals and Hospital Service Plans."

Dr. William A. O'Brien of Minneapolis gave the banquet address at the convention, September 19.

As part of the convention activities, the Minnesota Hospital Association sponsored a Minnesota Breakfast at the Statler Hotel, September 17, with President Ray Amberg of Minneapolis presiding.

\* \* \*

Dr. E. S. Platou of Minneapolis was reelected president of the Minnesota State Board of Health at a meeting, August 29, and Dr. T. B. Magath of Rochester was elected vice president succeeding T. G. Bell of Duluth, who retired from the board.

Leo Thompson of Little Falls has been appointed to the board to succeed Mr. Bell, and Dr. F. W. Behmmer of Morris has been named to succeed Dr. E. T. Fitzgerald, also of Morris.

Other board members are Ruth Boynton, M.D., Minneapolis; Prof. F. E. Bass, C. E., Minneapolis; A. G. Schulze, M.D., Saint Paul; A. C. Kean, D.D.S., Grand Rapids; and Prof. Gustav Bachman, Pharm. D., Minneapolis.

Dr. A. J. Chesley of Saint Paul was re-appointed by the board as secretary and executive officer.

\* \* \*

Several Minnesota men will participate in the program of the American Academy of Ophthalmology and Otolaryngology when it meets in Cleveland, October 6 to 10, inclusive.

Drs. A. D. Prangen and Gordon B. New of Rochester will present papers at afternoon sessions. Dr. Prangen will also lead a discussion, as will Dr. Anderson C. Hilding of Duluth.

Among those scheduled to give instruction courses at the morning sessions are Drs. Frank E. Burch and

Hendrie Walter Grant of Saint Paul; Drs. Lawrence Randall Boies, Horace Newhart, and Walter E. Camp of Minneapolis; Drs. New, Henry P. Wagener, and Henry L. Williams of Rochester; and Dr. Hilding of Duluth.

Dr. Erling W. Hansen of Minneapolis is secretary of public relations for the academy, and Dr. William L. Benedict of Rochester is secretary for the Section of Ophthalmology.

Dr. Benedict will present a paper at the Pan-American Congress of Ophthalmology being sponsored by the Academy at the conclusion of its session. At this Congress, October 11 and 12, papers will be presented in the English, Spanish and Portuguese languages, with translations.

\* \* \*

Seventy-three medical and administrative executives will make up the United States General Hospital unit, No. 26, which is being organized at the University of Minnesota under the direction of Dr. Harold Diehl, dean of medical sciences.

Plans for the organization of the unit were outlined by Dr. Diehl, who recently returned from Washington, D. C., where he conferred with officials about the formation of the wartime hospital unit.

The 73 medical and administrative executives will be taken from the faculty, the part-time faculty and the fellows doing postgraduate medical work at the university. Implemented with nurses, technicians and orderlies, such a staff could care for 1,000 wounded. Its rôle would be treatment well back of the lines of soldiers whose cases are too severe for care at front line first-aid stations.

In the unit will be specialists in communicable diseases, psychiatry, tuberculosis, heart diseases, skin disorders, metabolism, allergies, plastic, urologic and other types of surgery and a host of others including x-ray.

In addition to the physicians and the administrative staff, the hospital unit will consist of 120 nurses, 64 technical sergeants, 17 corporals, 140 first-class privates, and 279 privates.

Joining the hospital unit is solely on a volunteer basis at the university, yet not a single member of the staff has failed to forward his application. Not all are being accepted, however, because some are considered more valuable in their teaching capacities, and others are in categories already filled. The medical members join the unit by signing up with the army reserve corps. They will not be called into service, however, unless actual war breaks out. The nurses will be received through the Red Cross and military helpers will be assigned by the war department.

\* \* \*

Among the seventy members of the University of Minnesota faculty promoted to a higher rank than they held last year, were thirty-two members of the Medical School staff. Of these, thirteen are from the Mayo Foundation staff.

Promoted from associate professor to full professorship were: Dr. Halvor O. Halvorson, bacteriology; Dr. Raymond N. Bieter, pharmacology; Dr. William A.

## OF GENERAL INTEREST

O'Brien, preventive medicine and public health, and director of Postgraduate Medical Education; Dr. Cecil J. Watson, professor of medicine, and director of the Division of Internal Medicine; Dr. William T. Peyton, professor of surgery and director of the Division of Neurosurgery; Dr. George O. Burr, professor of botany and of physiology and also director of the Division of Physiological Chemistry.

Raised to the rank of associate professor from assistant professor or other rank were: Dr. Starke R. Hathaway, clinical psychologist and associate professor of nervous and mental diseases; Dr. James B. Carey, clinical associate professor of medicine; Dr. Arthur C. Kerkhof, clinical associate professor of medicine; Dr. Wallace D. Armstrong, associate professor of physiology, and director of biological research in dentistry. Also Drs. Della G. Drips, Howard K. Gray, Samuel F. Haines, Howard R. Hartman, Howard L. Mason, Charles W. Mayo, Harry L. Smith and Marschelle H. Power (experimental biochemistry), all of the Mayo Foundation.

Promoted to assistant professor: Drs. Phillip Hallock, Charles J. Hutchinson, Horatio B. Sweetser, clinical assistant professors of medicine; Drs. Claude J. Ehrenberg and Everett C. Hartley, clinical assistant professors of obstetrics and gynecology; Dr. Herman E. Hilleboe, clinical assistant professor of preventive medicine and public health; Dr. L. Earle Arnow, assistant professor of physiology; Dr. Miland E. Knapp, radiology and physical therapy; Dr. Donald W. Cowan, Students Health Service. Also Drs. Byron E. Hall, H. Corwin Hinshaw, Charles H. Slocumb, Edward B. Tuohy and Marvin M. D. Williams of the Mayo Foundation.

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### OPENINGS IN THE NAVY

The Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the Marine Corps. Examinations for appointments as commissioned officers in the Medical Department of the Navy will be held January 6 to 9, 1941.

Appointments are being made in the Medical Corps, United States Naval Reserve, of male citizens of the United States, graduates of class "A" medical schools, who are under 50 years of age and who meet the physical and professional requirements.

The examination to be held in January will be for appointment as Assistant Surgeon, in the Medical Corps of the Regular Navy, effective approximately two months from date of examination, and for Acting Assistant Surgeon (Intern), effective July 1, 1941. Requests for authorization to appear for these examinations should be submitted to the Bureau of Medicine & Surgery, Navy Department, Washington, D. C., in sufficient time to permit the authorization to reach the applicant prior to December 30, 1940.

Applicants for appointments as Assistant Surgeon must be citizens of the United States between the ages of 21 and 31, graduates of Class "A" medical schools and have completed one year of intern training in a

hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association.

Applicants for appointment as Acting Assistant Surgeon (Intern) are not required to submit evidence of previous intern training, and are appointed for a period of eighteen months, during which time they serve as interns in the larger naval hospitals which are approved for intern training. After completion of one year of service Acting Assistant Surgeons are eligible for examination for appointment as Assistant Surgeons. Acting Assistant Surgeons and Assistant Surgeons receive the pay and allowances of a Lieutenant (junior grade).

The Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the U. S. Marine Corps. Service for medical officers is active professionally and attractive in the shore duty, sea, and foreign shore station assignments. In the normal rotation of assignments every practicable consideration is given the officer's preference for the type of duty he desires. The Naval Medical School at the Naval Medical Center, Washington, D. C., offers a course of post-graduate instruction and instruction in those branches of medicine which apply particularly to the Naval Service. Under normal conditions newly appointed medical officers are assigned to this course upon entry into the service or during their first few years of naval service.

Naval medical officers are encouraged to develop a specialty after they have completed their first cruise at sea. Shortly before completion of his sea duty, the Navy doctor may request special training in the Medical Department specialty in which he is interested. Such requests are acted upon by a special board in the Bureau of Medicine and Surgery and, if approved, the Navy doctor is sent to a hospital for training and experience in that specialty for one year. Upon completion of this training, he is assigned to post-graduate instruction at one of the many medical centers in the United States for a period up to one year after which, in so far as is practicable, he is retained in that type of duty.

The service affords excellent opportunities for professional advancement. Medical officers receive the same pay and allowances as other officers of the Navy in corresponding ranks and the equivalent amount of service.

A circular of information for applicants for appointment as medical officers of the Navy, containing full information regarding physical requirements, professional examinations, rates of pay, and promotion and retirement data may be obtained by addressing the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Applicants for appointment in the Medical Corps of the United States Naval Reserve should be addressed to the Commandant of the Ninth Naval District, Great Lakes, Illinois, who will upon request furnish complete information regarding vacancies in ranks, etc., of officers of the Medical Corps, United States Naval Reserve in the district.

## In Memoriam

### William Hugh Carroll

Dr. Walter H. Carroll, senior resident physician at Glen Lake Sanatorium, died August 7, 1940, at Eitel Hospital, Minneapolis. Dr. Carroll was thirty-one years old and had been ill seven weeks.

He was born at Gilbert, Minnesota, March 3, 1909, and moved with his parents to Hibbing in 1913. Here he graduated from high school in 1927 and Junior College in 1929. He received his medical degree from the University of Minnesota Medical School in 1932. In 1933 he finished a year's internship at the University Hospital and finished a six months' fellowship in surgery at the same hospital in 1934. After filling a locum tenens for three months at Aitkin he went to Glen Lake Sanatorium in October, 1934, and was senior resident physician at this institution at the time of his death.

On July 2, 1938, Dr. Carroll married Fern Carlson, a social service worker at Glen Lake Sanatorium, but formerly of Saint Paul. She and an infant daughter, born October 19, 1939, survive him. He is also survived by his father and mother, Mr. and Mrs. Edward G. Carroll of Hibbing; a brother, John E. Carroll of Chicago, and two sisters, Katherine of Minneapolis and Margaret of Hibbing.

### Joseph Michael Hilger

Dr. Joseph M. Hilger, for thirty-six years a practitioner at Iona, Minnesota, died suddenly at his home on September 5, 1940.

Dr. Hilger was born in Mazeppa, Minnesota, December 29, 1879. He received his early education at the Mazeppa public schools and received his medical degree at the University of Illinois in Chicago in 1903. He was licensed in Minnesota in 1904 and began practice that year in Iona.

Dr. Hilger married Rosella Haumasser June 30, 1908, at Fulda. Nine children have blessed this union, four sons and four daughters surviving.

Dr. Hilger was a member of the Catholic Order of Foresters and the Knights of Columbus.

Dr. Hilger began his career before modern automobile transportation became what it is, when a physician was forced to rely upon the horse and buggy. He will be sadly missed by the families he has helped and counseled during his thirty-six years of practice.

### Alvah H. Jensen

Dr. Alvah H. Jensen of Hutchinson, Minnesota, died suddenly of a heart attack on July 8, 1940, at the age of forty-four.

Dr. Jensen was born February 13, 1896, in Wisconsin. He moved with his parents to Minden, Nebraska, where he attended high school. After a year of medicine at the University of Nebraska, he continued his medical education at the University of Minnesota. In

April, 1918, he enlisted in the Navy and made several trips across the Atlantic during the war. After the war he completed his medical education at the University of Minnesota and served his internship at Bethesda Hospital, Saint Paul, and in the Shriners' Hospital. He practiced in Saint Paul a year before going to Hutchinson in August, 1926.

Dr. Jensen was a member of the McLeod County Medical Society, the Minnesota State and American Medical Associations.

### Louis Watson Satterlee

Dr. Louis W. Satterlee, for over thirty years health officer of Alexandria, passed away at his home August 30, 1940, at the age of eighty-five.

Dr. Satterlee was born at Nunda, New York, April 21, 1856. In 1868 he moved with his parents to Etna, Pennsylvania. Later he attended Western University at Pittsburgh. From 1876 to 1878 he taught rural schools in Alleghany County, and the next twelve years were spent in Bradford, Sawyer City, West Hickory and Grand Valley, Pennsylvania.

On April 9, 1884, Dr. Satterlee married Mary Adella Prosser. Two children, Cleora Lois (Mrs. Harry J. Havens) now of Miltona, and Levi Herbert Satterlee, now of Sunland, California, survive.

Dr. Satterlee moved to Chicago in 1891 and studied medicine at the Hahneman Medical School there. After graduation in 189, he located in Murdock, Minnesota. Here his wife died in 1899.

In 1902 Dr. Satterlee moved to Clearwater, Minnesota, and September 12, 1903, he married Josephine Boutwell. Two children, Dorothy and Kenneth were born of this union.

In 1905 Dr. Satterlee moved to Alexandria, and with the exception of a few years spent at Pequot, Parkers Prairie and Villard, Alexandria has since been his home. He was a member of the Congregational Church and of the Modern Woodmen.



## REPORTS and ANNOUNCEMENTS

### MINNEAPOLIS CLINICAL CLUB

The program for the October tenth meeting of the Minneapolis Clinical Club in the Medical Arts Building follows:

"Kodachrome Photography in Dermatology"—Dr. Carl W. Laymon  
"Factual Proctitis Caused by Irradiation" and "Value of Macroscopic and Microscopic Examination of Excised Rectal and Anal Tissue"—Dr. Harry W. Christianson.  
"Gastroenterostomy" (a motion picture)—Dr. James M. Hayes.

Dr. Lawrence R. Boies is president of the club, and Dr. Ernest R. Anderson, secretary.

### MINNEAPOLIS SURGICAL SOCIETY

The Minneapolis Surgical Society will have Dr. Alton Ochsner of New Orleans as its guest speaker at its meeting Thursday, November 7. The topic of Dr. Ochsner's address has not yet been announced.

### MINNESOTA PATHOLOGICAL SOCIETY

The Minnesota Pathological Society will hold its first meeting of the 1940-41 season at 8 p. m. October 15 in the amphitheater of the Institute of Anatomy at the University of Minnesota. The speaker will be Dr. Wesley W. Spink, whose topic is "Pathogenesis and Treatment of Staphylococcal Infections." There will be a discussion by Dr. E. T. Bell.

### OLMSTED-HOUSTON-FILLMORE- DODGE COUNTY MEDICAL SOCIETY

Fourteen new members were added to the Olmsted-Houston-Fillmore-Dodge County Medical Society at a meeting in Rochester, September 4.

Accepted were Drs. R. Beck, John S. Drapiewski, Eldon W. Erickson, William J. Ferguson, Harry Penn Harper, Charles S. Joss, Wallace W. Lindall, Arthur J. Movius Jr., Harold A. Smedal, Charles S. Stroebel Jr., Ray D. Williams, Clyde O. Wood, William Walter Wood and Russell Grant.

### SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Officers of the Southern Minnesota Medical Association elected at the association's meeting in Red Wing, September 23 are: Dr. Walter Henry Valentine of Tracy, president; Dr. A. E. Benjamin of Minneapolis, first vice president; Dr. Edward H. Juers of Red Wing, second vice president. Dr. N. W. Barker of Rochester was re-elected secretary-treasurer.

Dr. James Morrow of Austin is the retiring president.

### UNIVERSITY OF MINNESOTA MEDICAL SCHOOL ALUMNI

A program of scientific papers and clinics has been arranged for the annual homecoming and meeting of

the Alumni Association of the University of Minnesota Medical School, October 25, the day preceding the University Homecoming football game.

The morning session will be followed by a short business session, and a complimentary luncheon at noon at the University of Minnesota Hospitals. Dr. Harold Benjamin, association president, will preside at the annual meeting.

The program of scientific papers and clinics will continue through the afternoon. It is also planned to arrange tours of the Medical Science building and the University of Minnesota Hospitals for visiting alumni.

The Class of 1920 will be honored guests at this homecoming.

### WABASHA COUNTY MEDICAL SOCIETY

The Wabasha County Medical Society will hold its seventy-second annual meeting at Plainview, Thursday, October 10, 1940.

The program will include a business session at 4 p. m., a dinner at 6:30 p. m., and a scientific session immediately following the dinner. Entertaining physicians are Dr. E. W. Ellis of Elgin, president of the society; Dr. D. G. Mahle of Plainview, vice president; and Dr. R. A. Glabe of Plainview. Entertainment for the ladies will be provided under the auspices of the Women's Auxiliary.

Dr. W. F. Wilson of Lake City is secretary of the society.

The program for the scientific session follows:

President's Address:

1. "Duties of Physicians in Relation to Medical Preparedness."
2. "Report of a Case of Ruptured Gastric Ulcer in a Diabetic Patient."—Dr. E. W. Ellis, Elgin.

"Review of Our Present Knowledge Concerning Acute Poliomyelitis."—Dr. F. M. Feldman, Rochester, District Director, Minnesota Department of Health.

"Report on Appendectomies."—Dr. C. G. Ochsner, Wabasha.

"Physical Therapy in General Practice."—Dr. M. E. Knapp, Minneapolis.

### MAYO FOUNDATION ALUMNI

The twenty-second annual meeting of the Alumni Association of the Mayo Foundation for Medical Education and Research will be held in Rochester, October 23, 24 and 25.

There will be scientific programs in the mornings and afternoons.

A special program has been planned for the evening of October 23, with talks by Dr. Donald C. Balfour, director of the Mayo Foundation; Dr. Theodore C. Blegen, dean of the Graduate School at the University of Minnesota; Dr. Louis B. Wilson, emeritus director of the Mayo Foundation; Dr. Guy Stanton Ford, president of the University of Minnesota; and Dr. George E. Vincent, president of the University of Minnesota.

(Continued on Page 752)



## TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, March 7, 1940

President, WILLARD D. WHITE, M.D., in the Chair  
Secretary, HARVEY NELSON, M.D.

### Symposium on Fractures and Other Trauma

#### INJURIES TO THE SHOULDER JOINT

GEORGE D. EITEL, M.D.  
Minneapolis

In reviewing injuries of this most movable joint, we are faced with many conditions which should be discussed but can only be mentioned because of the brief time allotted.

Contusions and sprains of the shoulder are common and my only purpose in mentioning them is because of the possible injury and rupture of the supraspinatus tendon and the injury to the long head of the biceps muscles. Diagnosis is sometimes difficult and may be overlooked. I also wish to mention very disabling sequelae following contusions, such as subdeltoid bursitis, and also arthritis and peri arthritis which may result from long continued immobilization and low grade infection. The treatment should consist of physiotherapy and more recently x-ray therapy has given excellent results.

Fractures of the clavicle are also common and treatment is directed toward obtaining extension on this long bone by various types of methods, all of which obtain the same result, which is usually one of union with some over-riding. Open operation is seldom necessary.

Fractures of the scapula are rare due to the firm attachment of muscles. A fracture through the blade seldom gives displacement. Fractures of the neck of the scapula or the lower edge of the glenoid require traction on the upper extremity in abduction or preferably in hypertension and abduction so that the capsular attachments will elevate the fragment. It must be held in this position for four to six weeks, depending on the amount of callus formation.

Injury to the brachial plexus of nerves must be kept in mind; this may be of varying degrees from a mild paresthesia to a complete paralysis. Treatment is directed toward relaxing tension on the plexus by placing the arm in abduction. Late pressure may develop from callus resulting from healing of severe fractures of the clavicle and removal of the callus from the inferior surface of the clavicle is sometimes necessary.

Dislocation of the clavicle both at the manubrial and acromial end occurs. Many times the patient says he has a bone sticking up on his shoulder which shows while he stands and the weight of his upper extremities makes the deformity apparent; but on lying down the end of the clavicle stays in place. Hence, x-rays should be taken with traction on the arm so that the acromioclavicular separation is demonstrable.

Dislocation of the head of the humerus is also a

common injury. One should be certain that there is not an accompanying fracture of the upper end of the humerus before reduction is attempted. For this, x-ray pictures are essential. If a fracture is also present, a different method of replacing the dislocation is used. The general rule is that the closer the fracture is to the dislocated head, the more difficult it is to replace the dislocation, and the lower down the fracture is, the easier to reduce the dislocation. This is due to the attachment of muscles on the proximal fragment. All dislocations should be reduced before the fracture is treated.

Fractures of the upper end of the humerus have been divided into fractures of the anatomical neck and of the surgical neck. However, we rarely see, or perhaps have never seen, a true anatomical neck fracture. Kocher, in 1896, classified them as follows: (1) supratubercular; (2) per-tubercular; and (3) infratubercular and he was experimentally on cadavers unable to produce a fracture of the anatomical neck in an adult. This classification, I think, is still the best and should be used more often.

Fractures involving the upper end of the humerus have caused all of us many difficulties: (1) in the reduction of the fractures; (2) in the maintenance of reduction by either an aeroplane splint, which has been in vogue for about twenty-five years, or by a massive plaster cast, or by fixed bed traction; and (3) in the long and many times permanent disability due to inability to abduct normally. The patient has likewise suffered from the cumbersome apparatus worn. We all have seen fractures in fairly good position with the upper extremity in the adducted position but when the conventional aeroplane splint was applied, the distal fragment was displaced into the axilla.

Drs. Howard and Eloesser of Stanford University, San Francisco, Cal., published a paper on this subject in 1934 in the *Journal of Bone and Joint Surgery*, and I would like to review briefly their most interesting work. All seventy-nine cases of fractures of the upper end of the humerus which they report were treated by the following method with excellent results and with a much reduced disability.

Briefly, their reduction is obtained by traction with the arm in the adducted position by virtue of the long head of the biceps bridging the fragments, and the remaining untorn periosteum. These structures hold the fragments in position. In three of their cases the long head of the biceps muscle was severed so the position could not be maintained, and open operation was done.

The dressing is as simple as the method of reduction. A small pad is placed in the axilla and along the

arm. The forearm is held flexed by a sling, while the arm is loosely bound to the body; the elbow is left free to allow the weight of the arm to act as a traction force.

The success of restoration of function rests on intelligent use of exercise. Gentle massage may be used from the beginning by removing the body bandage. A small range of passive motion may be used in the first week, carefully controlled by the surgeon himself. At the end of the second week active motion is instituted. The bandages are removed; the patient stands with the sound arm resting on a chair or desk and, bending forward, allows the injured arm to hang unsupported. The arm may be safely swung forward and backward and in small circles. The range of motion is increased so that by the end of the third week from seventy-five to ninety degrees of abduction are possible by tilting the trunk in this stooping-standing position. Such ranges of motion may be undertaken early, since at no time do the muscles bear the full weight of the limb as in the upright position. At the end of the fourth week more strenuous active motion, to the point of pain, is advised, and in eight weeks' time the patient has a painless, movable, and useful shoulder, with almost normal range of motion that increases as the arm is used in the daily tasks of the individual.

## PERIPHERAL NERVE SURGERY

GEORGE R. DUNN, M.D.  
Minneapolis

Peripheral nerve injuries of clinical importance occur quite commonly. Recognition of a nerve lesion prior to any operative or manipulative procedure in an acute surgical case is highly important. It is quite possible in a very short time to determine whether or not there is any nerve injury of magnitude. In making these quick, rough tests, it is not necessary to carefully test out the entire motor and sensory distribution. For example, the ulnar nerve usually supplies sensation to half the ring finger, the small finger and the corresponding portion of the hand on the palmar and dorsal surfaces; consequently, in testing for gross sensory loss in the ulnar nerve one can quickly test any loss of sensation on the small finger.

In the upper extremity we may consider rough tests for four important nerves:

**Musculospiral.** A gross lesion of this nerve produces a wrist drop, and impaired sensation over the dorsum of the thumb.

**2. Median nerve.** Injury to this nerve produces a loss of feeling on the palmar surface of the index and middle fingers and a corresponding area over the palm of the hand.

**3. Ulnar nerve lesions** produce a loss of sensation on the small finger and a corresponding area on the palm of the dorsum of the hand.

The circumflex nerve which winds about the neck of the humerus is frequently injured in shoulder joint dislocations and injury to this nerve produces a paralysis of the deltoid muscle and an impairment in sensation over the deltoid area.

In the lower extremity the nerves most frequently injured are:

**1. The external popliteal branch of the sciatic** which can readily be tested by checking the sensation on the dorsum of the foot and the power to dorsiflex the foot.

**2. The tibial nerve,** less frequently injured, can be checked by determining any gross loss of sensation on the plantar surface of the foot and the ability to plantar flex the foot.

**3. Sciatic nerve injury** produces signs referable to the external popliteal nerve, the tibial nerve or a combination of both.

**4. Femoral nerve injuries** cause a loss of power of the quadriceps muscle and a loss of sensation over the overlying skin area.

These nerves may be injured: (1) by trauma (without severance), (2) by compression in scar or callus; (3) by complete or partial division due to penetrating or incised wounds.

A nerve merely traumatized usually recovers in four to eight weeks with rest and proper splinting. The splint should be applied in such a manner as to relax the muscles which the nerve supplies to prevent overstretching of these muscles during the temporary cessation of the function of the nerve. The musculospiral nerve may be so affected. In this instance the hand, wrist and fingers should be supported by a cock-up splint in a position of dorsiflexion.

All these nerves described are mixed motor and sensory nerves and when one encounters a motor loss without any sensory loss one should bear in mind the possibility of poliomyelitis.

The physiological continuity of a nerve is occasionally, although rarely, interrupted by scar tissue formation or callus formation pressing on the nerve. Simple liberation of the nerve from the scar or callus (neurolysis) by an operative procedure and proper protection of the nerve by muscle or fat to prevent recurrence of the pressure usually give a satisfactory result.

Puncture, incised, or lacerated wounds may result in a partial or complete severance of the nerve. When the nerve is partially severed and the condition is not recognized at the time of the injury, a scar usually forms in the nerve preventing the establishment of physiological continuity. Whether or not a condition of this sort requires later operative procedure depends on the magnitude of the injury, the amount of pain, and the loss of function it causes. If the scar is small and discreet (Fig. 1, upper diagram), it is sometimes possible to resect the scar and suture without damage to the remainder of the nerve. By this method one can be fairly certain of not increasing the magnitude of the nerve injury irrespective of the result obtained in the partial nerve suture.

When the scar is diffuse and involves the entire nerve to a certain extent (Fig. 1, lower diagram), a complete division of the nerve may be necessary to remove the scar. Whether or not this is advisable will depend entirely on the extent of the nerve lesion. Nerve regeneration is never complete after resection and end-to-end suture. The question will naturally arise, in any incomplete nerve lesion of this sort, whether the

end-result after resection of a diffuse scar and suture of the nerve will improve the function of the nerve. Resection should not be advised unless improvement is fairly certain.

Causalgia is a painful condition which occurs in a variety of incomplete nerve lesions but on occasions

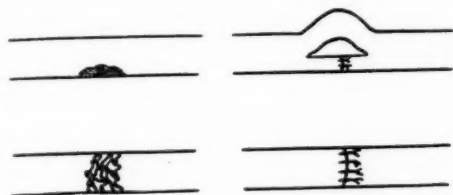


Fig. 1. Partial and complete resection of nerve for intrinsic scar (diagrammatic).

arises from intrinsic or extrinsic scars affecting the nerve. Pressure from extrinsic or intrinsic scars may give rise to considerable pain, circulatory and trophic disturbances. If the scar is extrinsic, neurolysis is the procedure of choice. If the scar is intrinsic, partial or complete resection of the scar may be indicated depending on the severity of the lesion. X-ray therapy in either case may be of some value. We have observed definite improvement following x-ray therapy in painful extrinsic and intrinsic scars affecting digital nerves which are difficult to treat surgically (intrinsic scars) due to the small size of the nerve.

Occasionally one encounters a scar confined to the nerve sheath, or nearly so, producing constriction of the nerve. Resection of the scar in the sheath in some of these cases gives excellent results.

Endeavoring to dissect out small groups of nerve fibers from an intrinsic scar may be possible in rare instances where the scarring is comparatively slight, not dense and confined to a limited area. Care and judgment must, however, be exercised in a procedure of this sort to avoid any extensive dissection of the nerve which will interfere with a later procedure.

After completing any surgical procedure on a nerve where formation of scar or adhesions may tend to invalidate the result, it is well to protect the nerve with fat or paratenon.

In cases where there has been a complete severance of the nerve from any cause, early diagnosis and primary end-to-end suture are indicated. The wound should be thoroughly cleansed, a careful debridement done and the nerve carefully sutured. The rough, uneven ends of the nerve should be carefully cross sectioned with a sharp knife until the normal fibers are visible.

At this stage of the procedure the nerve can be handled by placing clamps or forceps on the obviously devitalized portion of the nerve which is to be trimmed away and not cutting entirely through the nerve until after the first suture has been placed. After obtaining, by partial cross-section, visibly good nerve fibers on both the proximal and distal ends, a fine interrupted or

mattress suture of fine silk or catgut is placed to approximate the nerve sheath. Care should be taken in placing this first suture not to rotate either end of the nerve out of its natural position as each nerve has its own architecture. After placing the first suture, the devitalized portion of the nerve can be entirely cut



Fig. 2. Resection of lacerated nerve ends preliminary to primary suture (diagrammatic).

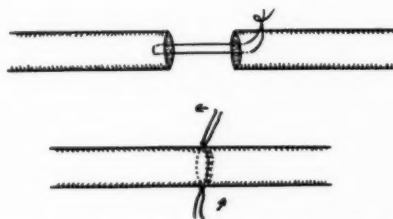


Fig. 3. Nerve suture half completed. By rotating the nerve by means of long sutures, the unsutured side of the nerve can be exposed and sutured (diagrammatic).

away and the second suture placed in the nerve sheath just opposite to the first suture. These two sutures can be left long. We thus have a suture at 12:00 o'clock and 6:00 o'clock, figuratively speaking. Using these sutures as retractors, the remainder of the sutures can be placed on one surface and, one of the original long sutures being passed beneath the nerve and the nerve rotated to present the opposite side, the remainder of the sutures are placed. This reduces to a minimum the handling of the nerve sheath by forceps. No sutures should be placed except in the nerve sheath. Close approximation of the nerve sheath throughout should be obtained.

Primary nerve suture permits approximation with minimal tension of the nerve, reduces the healing time, minimizes the degenerative process which occurs in the distal portion of the nerve, minimizes the muscular atrophy which follows a nerve lesion, prevents retraction of the nerve, and eliminates neuroma formation. If, through any complication, regeneration fails to occur after primary suture, the close approximation of the nerve ends simplifies secondary suture.

Secondary nerve suture is frequently done a considerable length of time after the original injury. Considerable separation of the nerve ends is frequently found. A neuroma will almost invariably be found on

the proximal segment of the nerve. Considerable atrophy of the distal segment of the nerve will have occurred and, consequently, the diameter of the proximal segment is considerably greater than the diameter of the distal segment.

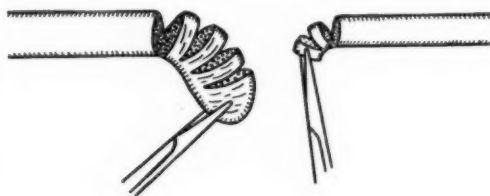


Fig. 4. Repeated cross-section of neuroma and scar, exposing good fibers for secondary suture (diagrammatic).

These conditions all interfere to a certain extent with nerve suture. Both the proximal neuroma and the scarred distal portion of the nerve must be repeatedly cross-sectioned until good fibers are visible in both segments. Due to the fact that the nerve fibers in the distal segment have undergone considerable degeneration, these fibers do not stand out as clearly on cross section as the fibers in the proximal segment and one must use considerable care in cross-sectioning the distal segment to remove all scar tissue and yet not sacrifice an unnecessary portion of the distal segment of the nerve. When good fibers have been exposed in both segments, the secondary suture is executed in the same manner as described for primary suture. Much larger portions of the nerve must, however, be sacrificed in secondary suture.

There may be a considerable gap between the nerve ends. This may be overcome by one or a combination of the following methods: (1) stretching the nerve; (2) flexion or extension of certain joints which tend to allow approximation of the severed ends; (3) transplantation of the nerve (for example, transplanting the ulnar nerve from its normal bed to a position anterior to the condyle of the humerus and flexing the elbow); (4) use of a nerve graft in the presence of a great gap.

All four methods lessen the chances of a fairly complete recovery compared with primary suture. Prompt recognition of a nerve lesion and primary suture is, therefore, highly important.

A nerve graft may be the only solution for an otherwise irreparable defect.

The type of graft diagrammed in Figure 5A may be used when a graft of proper diameter is available. For example, resection of an entire segment of the sciatic nerve in the thigh may be necessary because of a tumor. The external popliteal group of fibers (external popliteal group of fibers) may then be used as a graft to establish the continuity of the internal group (tibial fibers). In the event that sufficient regeneration takes place in the internal group of nerve fibers to supply some function to the plantar flexor muscles of the foot a drop-foot apparatus may be worn to com-

pensate for the paralysis of the muscles supplied by the external popliteal branch of the nerve, and the patient may be able to make some use of the leg.

In other instances two or more strands of a smaller nerve (Fig. 5B) may be used as a graft to bridge a

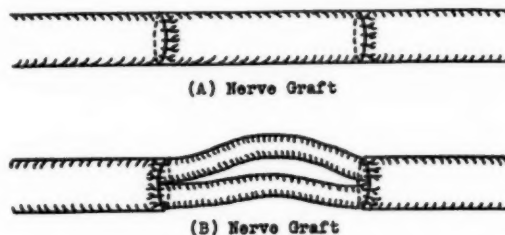


Fig. 5. Two types of nerve graft.

defect in a larger, more important nerve. The internal cutaneous nerve in the arm may be used in this manner to restore the continuity of the ulnar, median or musculospiral nerve.

Nerve fibers grow slowly and if a nerve graft 5 or 6 centimeters in length is used it will require a considerable period of time for the fibers to reach the distal line of suture. The possibility of scar tissue sealing off the second line of suture must be remembered and the advisability of resecting this area and resuturing at the proper time should be considered. I have only seen one fairly successful nerve graft.\*

In doing either a primary or secondary nerve suture, one must be rather careful in the identification of structures for suture of a nerve to a tendon has occurred. This error is most commonly made in suturing the proximal end of a severed median nerve to the distal end of the palmaris longus or one of the other flexor tendons of the wrist or hand. The proximal end of a severed tendon retracts more markedly than the proximal end of the severed nerve so it frequently happens that the nerve will be first located in the wound. The nerve presents a greyish color, has a definite sheath, and a typical appearance on cross section as compared with the white, shiny appearance of a tendon. Rather firm traction on the distal end of the median nerve may produce slight flexion of the thumb, index and middle finger but this action is not easily confused with the definite response one obtains from traction applied to the distal end of a tendon.

Postoperative proper splinting to prevent joint movement throwing undue strain on the line of suture is important. Baking and massage and electrical stimulation tend to minimize muscular atrophy during the process of nerve regeneration. Care, however, must be exercised in instituting physiotherapy to avoid throwing undue strain on the line of nerve suture too early.

Of the commonly injured nerves, the musculospiral and the external popliteal frequently give the most satisfactory results. These nerves are both largely motor in function, have comparatively small numbers of

\*Examined at 2nd Northern General Hospital, Leeds, England, in 1917.



sensory fibers and control coarse movements, the dorsi-flexion of the hand and foot respectively.

End-results of nerve suture vary between no return of function and approximately an 80% return of function. Generally speaking, the best results follow primary suture although very good results may be obtained by secondary suture performed at a considerable interval of time after the injury. The complete failures are usually due to separation of the suture line following suture under too great tension or improper immobilization of adjacent joints, thus allowing tension to be placed on the suture line.\*

### TREATMENT OF TRIMALLEOLAR FRACTURES OF THE ANKLE

M. C. NELSON, M.D.  
Minneapolis

Because this paper has been accepted for publication in *Surgery, Gynecology and Obstetrics* and will appear in this periodical in an early issue, it is possible to give only a brief summary of the paper as presented before this Society. The presentation was prefaced with a few remarks of a historical nature, and then the results of the treatment of 359 ankle fractures treated at the Minneapolis General Hospital in a five-year period ending July 1, 1939, were summarized. From a detailed study of these fractures, several conclusions were drawn and these illustrated by lantern slides of drawings and x-rays.

Briefly, the conclusions are: A "classical" trimalleolar fracture, that is, one in which the posterior tibial fragment involves one-third or more of the distal tibial articular surface, is the most difficult of all ankle fractures to treat, and probably also the most poorly treated. Open reduction and internal fixation is practically always necessary. A "minimal" trimalleolar fracture, that is, one in which the posterior tibial fragment involves less than one-third of the distal tibial articular surface is a common ankle fracture and can be reduced by manipulation, and the reduction maintained by a plaster cast. Considerable offset of the posterior fragment does not preclude a good result.

### INJURIES OF THE POSTERIOR URETHRA

T. H. SWEETSER, M.D.  
Minneapolis

The subject assigned to me covers such a wide field that time forces me to limit my discussion to one type of injury. I wish to discuss the rupture of the posterior urethra where it passes from the prostate into the triangular ligament, since this is so often associated with fractures of the pelvis, and other serious injuries.

\*For a summary of the bibliography on this subject up to January, 1930 (1958 references) see, "Peripheral Nerve Injuries" by Lewis J. Pollock, M.D., and Loyal Davis, M.D., published by Paul B. Hoeber, Incorporated, New York, in 1933.

That injury of the urethra is in itself a serious injury and demands prompt and accurate diagnosis and adequate treatment.

Occasionally the urethra in that location is partially severed and may be treated simply by drainage with an indwelling catheter. I can remember two patients whom I treated in that way with good results. One was an old man who was butted against a post by a bull, suffering fracture of the pelvis and partial severing of the urethra. The other suffered a similar injury when the wall of a trench fell in on him.

Occasionally there is simply the matter of proper diagnosis of some minor urethral lesion in the presence of a fracture of the pelvis or other severe injury. One patient recently had a severe head injury and a dislocation of the hip. He did not void and the house surgeon suspected rupture of the posterior urethra when he was unable to pass a catheter. He actually had a tight old stricture of the membranous urethra and was adequately relieved by passage of filiforms and followers.

The serious injury which I wish principally to call to your attention is a complete rupture of the urethra with a displacement of the prostate and bladder upward away from the triangular ligament and with collection of a hematoma in the intravaginal space. Fortunately the bladder is not usually ruptured and the patient has not voided any urine into the hematoma. He comes to the hospital usually in severe shock with a fracture of the pelvis and sometimes with a head injury or other associated trauma.

Drainage of the perivesical tissue is imperative and any attempt to put the patient in lithotomy position for perineal incision would risk further severe damage from the broken pelvic bones and would not adequately solve the problem of drainage and repair. A suprapubic cystostomy and evacuation of the perivesical hematoma is essential; the patient's condition may be so poor that no further initial treatment is justified. If anything further can be done without too much risk, the torn ends of the urethra should be brought together as well as possible.

My first attempt at accomplishing this last effect was in August, 1928, when I used a Pilcher Bag by the method which has since been described and illustrated by Ormond and Cothran in 1934.<sup>1</sup> In our case we exerted traction on the tube passing through the urethra by means of rubber bands running to the foot of the bed. Unfortunately a fistula was created at the penoscrotal junction by pressure of the tube, because of the fairly sharp curve at that point. The use of a wire basket to prevent this sharp curve would probably have prevented the formation of the fistula.

Another patient with a similar injury was treated by my associate, Dr. Polzak, by suprapubic cystostomy and insertion of a soft rubber catheter through the damaged urethra under suprapubic guidance without any attempt to bring the damaged segments together. This patient healed well but we have had considerable difficulty in treating the traumatic stricture and have had to remove one bladder calculus by cystostomy.

Still another child was treated by my associate, Dr.

Gingold, by suprapubic cystotomy. Because of the patient's extremely poor condition nothing more was done for twelve days, when bladder drainage was instituted through perineal urethrotomy; the suprapubic drainage tube was removed six days later and the perineal catheter sixteen days later still. Occasionally dilatation of the urethra was done for a time and the result was satisfactory.

It seems to me that one can depend on intra-abdominal pressure to push the bladder and prostate down into position without traction. When the patient's condition permits it, at the time of cystotomy, one need only place a catheter through the ruptured part of the urethra to guide proximal segments into close apposition with the distal segments. The method described by H. W. Martin in 1935<sup>1</sup> seems to me to best accomplish this mostly quickly and with less disturbance to the patient. A full curved sound is passed from the bladder through the prostatic and membranous urethra to the bulb where its end is pressed against the perineum. Without elevating the thighs the operator feels the end of the sound through the perineum and releases it through a small midline incision. A rubber tube is prepared with numerous holes on the side to insure drainage of the perivesical tissue, as well as the bladder. The end of this tube is placed on the end of the sound and guided from the perineum through the urethra into the bladder and is held in place by string fastened to the suprapubic wound.

The simplicity and effectiveness of this method can be appreciated by referring to the drawings which accompany the article by Ormond and Cothran and comparing the two methods.

#### References

1. Martin, H. W.: Injuries to posterior urethra. *Jour. Urol.*, 34:718, (Dec.) 1935.
2. Ormond, J. K., and Cothran, R. M.: Simple method of treating complete severance of urethra complicating frac-

#### MAYO FOUNDATION ALUMNI

(Continued from Page 746)

from 1911 to 1917. Following this meeting, the members will adjourn and go to the Mayo Foundation House where portraits of Dr. William J. and Charles H. Mayo will be unveiled.

The annual banquet of the association will be October 24. The annual business meeting has been scheduled for the afternoon session, October 25.

Dr. Lester D. Powell of Des Moines is president of the association; Dr. Porter P. Vinson of Richmond, Virginia, first vice president; Dr. William H. Long of Fargo, North Dakota, second vice president; Dr. J. Richard Aurelius of St. Paul, secretary; and Dr. D. Morrison Masson of Rochester, associate secretary and treasurer.

## BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

#### BOOKS RECEIVED FOR REVIEW

MANAGEMENT OF THE CARDIAC PATIENT. William G. Leaman, Jr., M.D., F.A.C.P. Assistant Professor of Medicine in Charge of Department of Cardiology, Woman's Medical College of Pennsylvania; Cardiologist Woman's College, Memorial, Northeastern Hospitals, and Philadelphia Hospital for Contagious Diseases, etc. 705 pages. Illus. Price, \$6.50, cloth. Philadelphia: J. B. Lippincott Co., 1940.

CHILD CARE AND TRAINING. Fifth Edition. Marion L. Faegre, Assistant Professor of Parent Education; and John E. Anderson, Director of Institute of Child Welfare, University of Minnesota. 320 pages. Illus. Price, \$2.50, cloth. Minneapolis: University of Minnesota Press, 1940.

APPLIED PHARMACOLOGY. Hugh Alister McGuigan, Ph.D., M.D., F.A.C.P. Professor of Pharmacology and Therapeutics, University of Illinois, College of Medicine. 914 pages. Illus. Price, \$9.00, cloth. St. Louis: C. V. Mosby Co., 1940.

TEXTBOOK OF MEDICINE. Fifth Edition. Edited by Russell L. Cecil, A.B., M.D., ScD. Professor of Clinical Medicine, Cornell University Medical College; Associate Attending Physician New York and Bellevue Hospitals, New York City. Associate Editor for Diseases of Nervous System: Foster Kennedy, M.D., F.R.S.E. Professor of Clinical Neurology, Cornell University Medical College; Attending Physician, New York Hospital; Visiting Physician in Charge Neurological Service, Bellevue Hospital; Consulting Physician New York Neurological Institute. 1744 Pages. Illus. Price, \$9.50, cloth. Philadelphia: W. B. Saunders Co., 1940.

PHYSICAL DIAGNOSIS. Second Edition. Ralph H. Major, M.D. Professor of Medicine in the University of Kansas. 464 pages. Illus. Price, \$5.00, cloth. Philadelphia: W. B. Saunders Co., 1940.

EPIDEMIC ENCEPHALITIS. Third Report by the Matheson Commission, Willard C. Rappleye, M.D., Chairman, Columbia University Press, Morningside Heights, New York. Pages XI-493. Price \$3.00.

The Matheson Commission was established through the generosity of Dr. William J. Matheson in the spring of 1927. Its first two years of work consisted largely of collecting the published data on the epidemiology, etiology and treatment of epidemic encephalitis. The first report was published in 1929, the second in 1932. Laboratory research was begun by the group in 1929 under the direction of Dr. Frederick P. Gay and has been specially concerned with herpes-like viruses.

The section on etiology summarizes the work done throughout the world from 1930 to 1938 in regard to the etiology of epidemic encephalitis; St. Louis type encephalitis; Japanese B type encephalitis; human encephalitis caused by the viruses of Eastern and Western equine encephalomyelitis; post-vaccinal encephalitis; post-infectious encephalitis; Australian x-disease and

## BOOK REVIEWS

hemorrhagic encephalitis. The greatest emphasis, of course, has been placed upon the first three mentioned. Two extremely important discoveries have been made: namely, the isolation of distinctly individual viruses causing St. Louis type encephalitis and Japanese B type encephalitis.

An exhaustive study of the treatment of epidemic encephalitis is given with attention called to the fact that it is difficult to evaluate treatment in this disease because of the variability of symptoms in the acute, sub-acute and chronic stages.

Of the various medications and procedures used in acute epidemic encephalitis, few are viewed favorably.

In 1933 the first summer epidemic of encephalitis to appear in the Western Hemisphere was reported from St. Louis, Missouri. A small outbreak had been noted in Paris, Illinois, in 1932. Another epidemic appeared in St. Louis in 1937. Clinically and epidemiologically, the illness closely resembles Japanese B type encephalitis but the two are differentiated immunologically. The epidemics have been preceded by a period of great heat and drought. Increase of incidence with increasing age is striking. Females and males were affected in the same ratio that they occurred in the general population. The mortality rate was about 20% as contrasted with 45-50% for epidemic encephalitis during epidemic periods, and 60-75% in epidemics of Japanese B type encephalitis. As noted above, a distinct virus has been isolated and its specificity demonstrated. Transmission

by non-human agents, including insect vectors, was excluded early. Direct contagion is infrequently recorded. Here again transmission is most likely through unrecognized carriers.

The Matheson Commission has published a carefully compiled survey of the work done all over the world in regard to the etiology, treatment, and epidemiology of encephalitis. Its claims for the laboratory and clinical research of its staff are very modest. More than 3,500 references are listed in the bibliography. The material is clearly and interestingly presented. This report forms a very useful reference book for laboratory workers and clinicians working on this exceedingly interesting, important but complicated disease.

WALTER P. GARDNER, M.D.

INTRODUCTION TO MEDICINE. Don C. Sutton, M.D., Associate Professor of Medicine, Northwestern University School of Medicine. With introduction by Ada Belle McCleery, R.N., Superintendent, Evanston Hospital, Evanston, Illinois. With 144 Text Illustrations and 14 Color Plates. St. Louis: The C. V. Mosby Company, 1940.

The appearance of a new medical textbook is no novelty. Unfortunately too many books appear that could well have remained unpublished since they add nothing new in material advance in the science or in the method of presentation by which the subject matter is presented more concisely, more interestingly or more

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easily comprehended. Sutton's Introduction to Medicine is a very welcome addition to medical literature. It is a book delightful to read and is authoritative in context. The subject matter is well systematized and the discussion of each topic is clear and concise. The introductory paragraphs to the discussion of the various diseases give clear definitions and descriptions of the disease. The presentation of symptoms and treatment under the various diseases, though brief, is comprehensive and thorough. The main physical findings are well incorporated in the discussions.

This book gives a very satisfactory bird's-eye view of the whole field of internal medicine. There are brief chapters on Bacteriology, Parasitology, Pathology, Laboratory Procedures, Dietetics and other fields of interest to the nursing profession in addition to the main subject matter which deals with all the different types of diseases and their treatment. This book can be recommended unreservedly to all training schools, nurses in training and graduate nurses as well as all those interested in a brief but comprehensive view of the field of medicine.

MOSES BARRON, M.D.

**DERMATOLOGIC THERAPY IN GENERAL PRACTICE.** Marion B. Sulzberger, M.D., and Jack Wolf, M.D. \$4.50. 680 pages. Illus. Chicago: Year Book Publishers, 1940.

Most textbooks on dermatology follow a uniform style—that is, the texts are classified in sections and each entity is taken up in definite order, namely, etiology, pathology, symptomatology and treatment. In this book under review, the conditions are entirely different. The chief concern of the authors here is treatment, whereas in most books treatment occupies a very minor part of the chapter. The average general practitioner is looking for just such a treatise as this. It is not to be denied that symptoms are important as well as diagnoses. Nevertheless, the doctor who gets a dermatological case is concerned mainly with the cure of it, probably more than with recognition.

The book covers most of the skin entities which one encounters, and the conditions selected for discussion have been carefully and wisely chosen. We find, for instance, an excellent chapter on the eczemas and the allergies and these are most painstakingly considered, having in view the latest investigations on these subjects. A very good chapter also covers the acnes, emphasizing the importance of radiation treatment. In following the instructions laid down here, the average practitioner could readily treat all acne cases which come to his office. Similarly, psoriasis and the fungi are

mentioned, and particularly the skin tumors, such as basal and squamous cell carcinomas which are handled most painstakingly and accurately as to their treatment.

Throughout the book there is a list of the therapeutic agents which are useful in treating the various skin conditions, for instance, lotions, baths, powders, combinations which make up salves and a concise description of roentgen and radium therapy. The specialist will find in this book a concise condensation of everything used in everyday practice. The general practitioner will welcome this book because it is mostly therapy and therapy is what he wants.

E. Z. SHAPIRO, M.D.

**NEWER NUTRITION IN PEDIATRIC PRACTICE.** I. Newton Kugelmass, M.D. \$10.00. 1,155 pp. 183 illus. Philadelphia: Lippincott Co., 1940.

This is an overwhelming book. Its scope is tremendous; every possible relation of nutrition to the growth, development and disease of children is discussed at length.

The book is divided into three main units:

1. *Nutritional Physiology* discusses the maintenance and metabolism of the child's body both as regards organic and inorganic nutrients, for as stated, "an intimate appreciation of body mechanisms displaces empirical, traditional methods by scientific procedures.

2. *Nutrition in Health* takes us from the newborn, with the usual complete discussion of formulas for every need, through the childhood period and ends with an excellent discussion of the psychology of the poor eater.

3. *Nutrition in Disease* calls the roll of all disease; nutritional, deficiency, metabolic, allergic, infectious and regional. However, the author does not adhere strictly to his text, as witness the section on infectious disease, wherein many conditions are discussed which have little relation to nutrition.

It is disappointing that there is no separation of statement between material or opinions which are the writer's own and those of others, for although a bibliography is given at the end of each chapter, no direct credit is given in the text for material drawn from individual investigators. Many procedures are included as good practice, i.e., intraperitoneal fluid and sinus transfusion, which are no longer countenanced by many pediatricians. Also, one hesitates to recommend this book for general reading, since many statements are made which would indicate a final decision had been reached on problems that are still subject to some controversy.

EARL E. BARRETT, M.D.

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